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# VEGAS™ PRO 11

User Manual

# What's new in version 11.0

### Video

- GPU-accelerated video processing. *For more information, see System requirements on page 19 and Video tab on page 416.*

  **NVIDIA GPUs**

  GPU-accelerated video processing requires an OpenCL-enabled GPU and driver 270.xx or later with a GeForce GT 2xx Series or higher GPU with 512 MB or more RAM.

  **AMD/ATI GPUs**

  GPU-accelerated video processing requires an OpenCL-enabled GPU and Catalyst driver 11.7 or later with a Radeon HD 57xx or higher GPU with 512 MB or more RAM. If using a FirePro GPU, FirePro unified driver 8.85 or later is required.

  For the latest information about supported hardware, please see our Web site at *http://www.sonycreativesoftware.com/vegaspro*.
- New Titles & Text plug-in. *For more information, see Adding titles and text with the Titles & Text plug-in on page 273.*
- Improved usability for the ProType Titler. *For more information, see Adding titles and text with the ProType Titler on page 273.*
- Added a new Star Wipe transition. *For more information, see Using transition effects on page 324.*
- Added a new Radial Pixelate video plug-in. *For more information, see Applying video effects on page 301.*
- Added per-parameter keyframes for many video plug-ins.
- The Transitions, Video FX, Media Generators, and (new) Compositors windows all include folders to group plug-ins and a search box to help you find plug-ins easily.
- The Stabilize plug-in has been simplified and improved. *For more information, see Stabilizing video clips on page 183.*
- The Stereoscopic 3D Adjust plug-in now includes Floating Windows controls to allow you to mask the edge of the video frame to compensate for screen-edge violations. *For more information, see Aligning left- and right-eye views and adjusting depth on page 128.*
- Added a **Stereoscopic 3D depth** control to the Cookie Cutter, Cross Effect, and Iris transitions.
- Support for NVIDIA 3D Vision on single-display systems using the Windows Graphics Card device. *For more information, see Configuring a Windows Graphics Card on page 421.*
- Event Pan/Crop is now integrated into the Video Event FX dialog.

### Audio

- Improved usability for the Mixing Console. *For more information, see Mixing Console window on page 193.*
- A simplified Master Bus window provides you with a streamlined view of your project's master output. *For more information, see Master Bus window on page 191.*

### Workflow

- Sync links provide an additional method of keeping events synchronized: a linked event retains synchronization when the event it is linked to is moved but can be moved independently. *For more information, see Using sync links on page 189.*
- An updated Render As dialog streamlines the rendering process and makes it easy to manage your favorite render templates. *For more information, see Rendering a project on page 363.*
- Integrated upload to YouTube. *For more information, see Uploading a movie to YouTube on page 377.*

**Formats**

- MainConcept AVC/AAC improvements:
  - Added MP4 templates for Internet distribution.
  - Added an **Enable progressive download** check box to the **Video** tab of the Custom Settings dialog to allow your videos to begin playing during playback.
  - Added support for GPU-accelerated rendering.
- Added support for RED EPIC® clips. *For more information, see Working with RED ONE and EPIC camera files on page 281.*

## Welcome

After Vegas® Pro software is installed and you start it for the first time, the registration wizard appears. This wizard offers easy steps that allow you to register the software online with Sony Creative Software Inc. Alternatively, you can register online at *https://www.sonycreativesoftware.com/reg/software* at any time.

## Registration assistance

Registration assistance is available online at *http://www.sonycreativesoftware.com/reg/faq* or by fax at (608) 250-1745.

## Customer service/sales

For a detailed list of customer service options, we encourage you to visit *http://www.sonycreativesoftware.com/support/custserv.asp*. Use the following numbers for telephone support during normal weekday business hours:

| Telephone/Fax | Country |
|---|---|
| (800) 577-6642 (toll-free) | US, Canada, and Virgin Islands |
| (608) 203-7620 | for all other countries |
| (608) 250-1745 (Fax) | All countries |

## Technical support

For a detailed list of technical support options, we encourage you to visit *http://www.sonycreativesoftware.com/support/default.asp*. To listen to your support options by telephone, please call (608) 256-5555.

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**élastique Pro**

Portions of this product use zplane élastique Pro V2 audio time-stretching technology.

**FLAC/Ogg File Formats**

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Chapter 1

# Introduction

## Welcome

Vegas® Pro software is an innovative and advanced multitrack media-editing system. Vegas Pro software was designed to create an efficient audio/video production environment without sacrificing the quality and processing power that you expect from Sony Creative Software Inc. Whether it's the standard and familiar Microsoft® Windows® navigation commands or the clean and uncluttered interface, you'll find Vegas Pro software to be a tool that will be mastered in minutes. Beneath the unique and customizable interface, you'll find a product that is both powerful and flexible.

## System requirements

In order to use Vegas Pro software, your computer must satisfy the following minimum specifications:

- Microsoft® Windows Vista® 32-bit or 64-bit SP2 or Windows 7 32-bit or 64-bit
- 2 GHz processor (multicore or multiprocessor CPU recommended for HD or stereoscopic 3D)
- 500 MB hard-disk space for program installation
- 2 GB RAM (4 GB recommended)
- OHCI-compatible IEEE-1394DV card (for DV and HDV capture and print-to-tape)
- USB 2.0 connection (for importing from AVCHD, XDCAM EX, NXCAM, or DVD camcorders)
- Supported NVIDIA or AMD/ATI GPU with 512 MB or more RAM:

| | AVC Rendering | Video Processing |
|---|---|---|
| NVIDIA | GPU-accelerated AVC rendering requires a CUDA-enabled GPU and driver 270.xx or later with a GeForce GT 2xx Series or higher GPU. | GPU-accelerated video processing requires an OpenCL-enabled GPU and driver 270.xx or later with a GeForce GT 2xx Series or higher GPU. |
| AMD/ATI | GPU-accelerated AVC rendering and video processing requires an OpenCL-enabled GPU and Radeon HD 57xx or higher GPU. If using a FirePro GPU, FirePro unified driver 8.85 or later is required. | |

  For the latest information about supported hardware, please see our Web site at *http://www.sonycreativesoftware.com/vegaspro*.

- Windows-compatible sound card
- DVD-ROM drive (for installation from a DVD only)
- Supported CD-recordable drive (for CD burning only)
- Supported DVD-R/-RW/+R/+RW (for DVD burning only)
- Supported BD-R/-RE drive (for Blu-ray Disc™ burning only)
- Microsoft .NET Framework 3.5 SP1 (included on application disc)*
- Apple® QuickTime 7.1.6 or later

You must provide your registration information to Sony Creative Software Inc., a US company, in order to activate the software. Product requires online registration within 30 days.

*.NET 3.5 adds functionality to .NET 2.0. After installing the .NET Framework 3.5, versions 2.0 and 3.5 will be displayed in the Windows Add or Remove Programs listing. Do not attempt to uninstall version 2.0; it is required by version 3.5.

## Technical support

The Web site at *http://www.sonycreativesoftware.com/support/default.asp* has technical support, reference information, program updates, tips and tricks, user forums, and a knowledge base.

## Installing Vegas Pro software

The install utility creates any necessary folders and copies all files required by Vegas Pro software to your computer.

### Installing from a boxed product

1. Place the Vegas Pro application disc in the drive. The setup screen is displayed if AutoPlay is enabled for your optical drive.

> **Note:** *If you have turned off the drive's AutoPlay feature, click the* **Start** *button and type* **D:\setup.exe**, *where D is the drive letter of your optical drive, and follow the on-screen prompts to complete the installation.*

2. Click **Install**, and then follow the on-screen prompts to install the appropriate version of Vegas Pro for your computer.

### Installing from the Web

1. Download the install utility from our Web site at *http://www.sonycreativesoftware.com/download/*.
2. Double-click the file, and then follow the on-screen prompts to install the appropriate version of Vegas Pro for your computer.

## Getting help

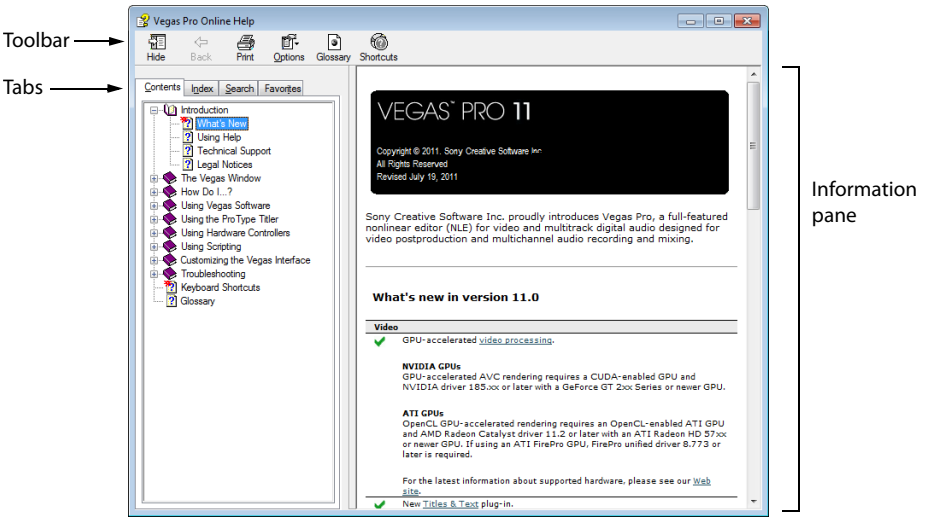
You can access two varieties of help within Vegas Pro:

- Online help
- Interactive tutorials

### Online help

To access online help, choose **Contents and Index** from the **Help** menu or press F1.

The online help window has four tabs that you can use to find the information that you need.


Toolbar
Tabs
Information pane
Vegas Pro Online Help
Hide
Back
Print
Options
Glossary
Shortcuts
Contents
Index
Search
Favorites
Introduction
What's New
Using Help
Technical Support
Legal Notices
The Vegas Window
How Do I...?
Using Vegas Software
Using the ProType Titler
Using Hardware Controllers
Using Scripting
Customizing the Vegas Interface
Troubleshooting
Keyboard Shortcuts
Glossary
VEGAS PRO 11
Copyright © 2011, Sony Creative Software Inc
All Rights Reserved
Revised July 19, 2011
Sony Creative Software Inc. proudly introduces Vegas Pro, a full-featured nonlinear editor (NLE) for video and multitrack digital audio designed for video postproduction and multichannel audio recording and mixing.
What's new in version 11.0
Video
GPU-accelerated video processing.
NVIDIA GPUs
GPU-accelerated AVC rendering requires a CUDA-enabled GPU and NVIDIA driver 185.xx or later with a GeForce GT 2xx Series or newer GPU.
ATI GPUs
OpenCL GPU-accelerated rendering requires an OpenCL-enabled ATI GPU and AMD Radeon Catalyst driver 11.2 or later with an ATI Radeon HD 57xx or newer GPU. If using an ATI FirePro GPU, FirePro unified driver 8.773 or later is required.
For the latest information about supported hardware, please see our Web site.
New Titles & Text plug-in.

| Tab | Description |
|---|---|
| Contents | Provides a list of available help topics. Click a closed book to open the pages, and then click on a topic page. |
| Index | Provides a complete listing of the help topics available. Scroll through the list of available topics or type a word in the **Type in the keyword to find** box to quickly locate topics related to that word. Select the topic and click the **Display** button. |

| Tab | Description |
|---|---|
| Search | Allows you to type a keyword and display all of the topics in the online help that contain the keyword you have entered. Type a keyword in the **Type in the word(s) to search for** box and click the **List Topics** button. Select the topic from the list and click the **Display** button. |
| Favorites | Allows you to keep topics that you revisit often in a separate folder. To add a topic to your favorites, click the **Add** button on the **Favorites** tab. |

### Interactive tutorials

You can learn more about many of the features in Vegas Pro by using the interactive tutorials installed with the software.

You can access the tutorials at any time by choosing **Interactive Tutorials** from the **Help** menu.

### Help on the Web

Additional help and information is available on the Sony Creative Software Inc. Web site. From the **Help** menu, choose **Sony on the Web** to view a listing of Web pages pertaining to Vegas Pro software and Sony Creative Software Inc. The software starts your system's Web browser and attempts to connect to the appropriate page on the Sony Creative Software Inc. site.

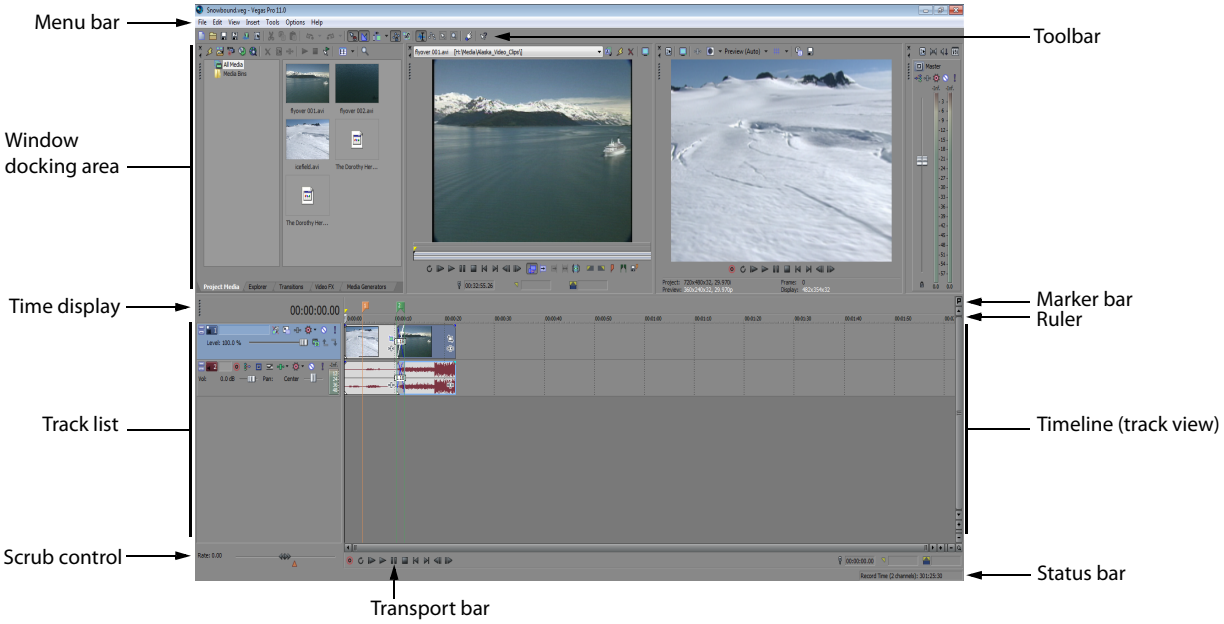
## Overview

Vegas Pro software is designed to be an easy-to-use program with many tools that provide power and flexibility when creating and working with multimedia files. Many operations, menu items, and shortcut keys are consistent with other popular Microsoft Windows software applications.

The following sections provide a graphical tour of the Vegas Pro workspace.

### Main window

This is the window that appears when the software is opened. The work area is subdivided into three primary areas: the track list, the timeline (track view), and the window docking area. You can resize the track list, timeline, and window docking area by dragging the dividers between them.




**Tip:** *If you prefer to work with the timeline at the top of the window and the docking area at the bottom of the window, clear the* **Display timeline at bottom of main window** *check box on the Display tab of the Preferences window. For more information, see* *Display tab on page 428*.

## Toolbar

The toolbar allows you to quickly access the most commonly used functions and features. From the **Options** menu, choose **Customize Toolbar** to specify which buttons are displayed. *For more information, see Customizing the toolbar on page 409.*

| | |
|---|---|
| | Create new project |
| | Open existing project |
| | Save project |
| | Save project with different settings |
| | Render project |
| | Open project properties |
| | Cut selected events or time range |
| | Copy selected events or time range |
| | Paste items from clipboard into project |
| | Undo |
| | Redo |

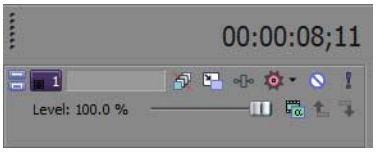
| | |
|---|---|
| | Enable snapping |
| | Enable automatic crossfades |
| | Enable automatic ripple editing |
| | Lock envelopes to events |
| | Ignore event grouping |
| | Normal edit tool |
| | Envelope edit tool |
| | Selection edit tool |
| | Zoom edit tool |
| | Interactive tutorials |
| | Context-sensitive help |

## Time Display

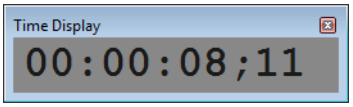
The Time Display window reflects the cursor's position on the timeline, MTC input, MTC output, or MIDI clock output time. You can customize time display settings, including what time the window displays and which colors are used in the display. *For more information, see Using the Time Display window on page 404.*

You can move the Time Display window from its docked position above the track list to float on the workspace or dock in the window docking area.

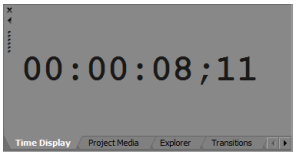
Docked position




Floating window




Docked in window docking area




## Ruler

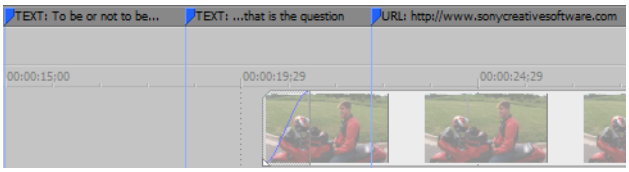
The ruler is the timeline for your project. You can specify how the ruler measures time: seconds, measures and beats, frames, etc. *For more information, see Changing the ruler format on page 402.*

## Marker bar

The marker bar is the area where you can place, name, and position markers and regions along the project's timeline. These informational tags can serve as cues or reminders highlighting important events in your project. *For more information, see Adding project markers and regions on page 93.*

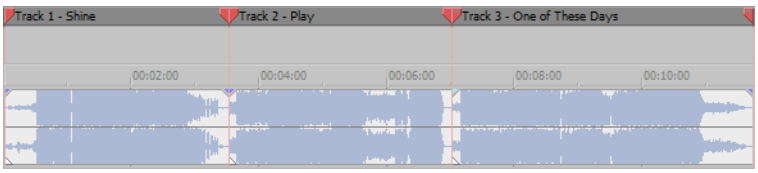
### Command bar

The command bar displays when you add a command to your project. Commands add metadata to media files to create effects such as closed captioning. *For more information, see Adding project markers and regions on page 93.*



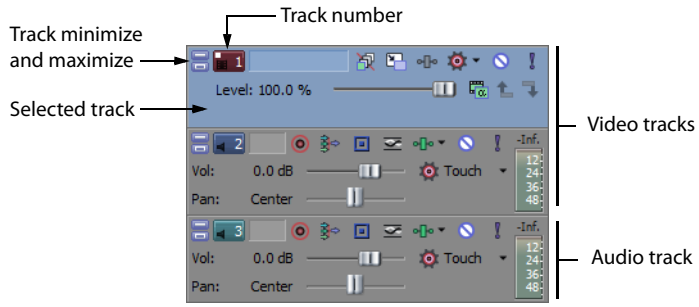

### CD layout bar

The CD layout bar displays tracks and indices in an audio CD layout project for disc-at-once (DAO) CD burning. *For more information, see Creating audio CD layout projects on page 388.*



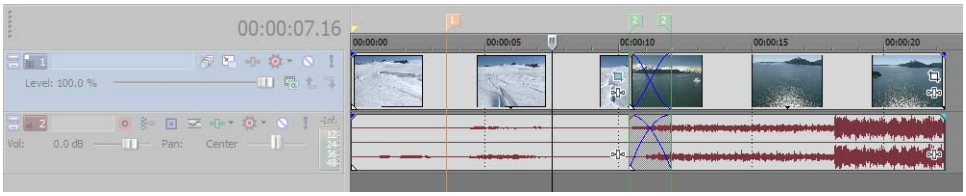

### Track list

This area identifies the track order in your project and contains controls used to determine track compositing and mixing. *For more information, see Using the track list on page 64.*




### Timeline

All arranging and editing is done in the timeline (track view). This area contains all of a project's events. *For more information, see Using the timeline on page 63.*



### Transport bar controls

The transport bar contains the playback and cursor positioning buttons frequently used while working on and previewing your project.

| | |
|---|---|
| Record into track | Stop playback |
| Loop playback | Move cursor to start of project |
| Play from beginning of project | Move cursor to end of project |
| Play project from cursor position | Move cursor to previous frame |
| Pause project playback | Move cursor to next frame |

**Tip:** *Click and hold the* **Previous Frame** *and* **Next Frame** *buttons to move the cursor multiple frames.*

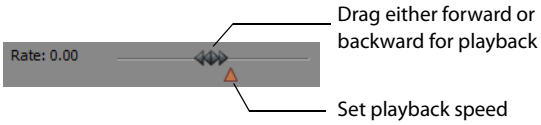
### Status bar

The status bar is located at the bottom of the main program window and displays information about roughly how much space is left on your computer to record audio (Record Time). During the rendering processes, the left side of the status bar also contains information about the progress of the render.

The Video Preview window also has its own status bar that displays project specific information. *For more information, see* *Understanding the Video Preview window* *on page* 345.

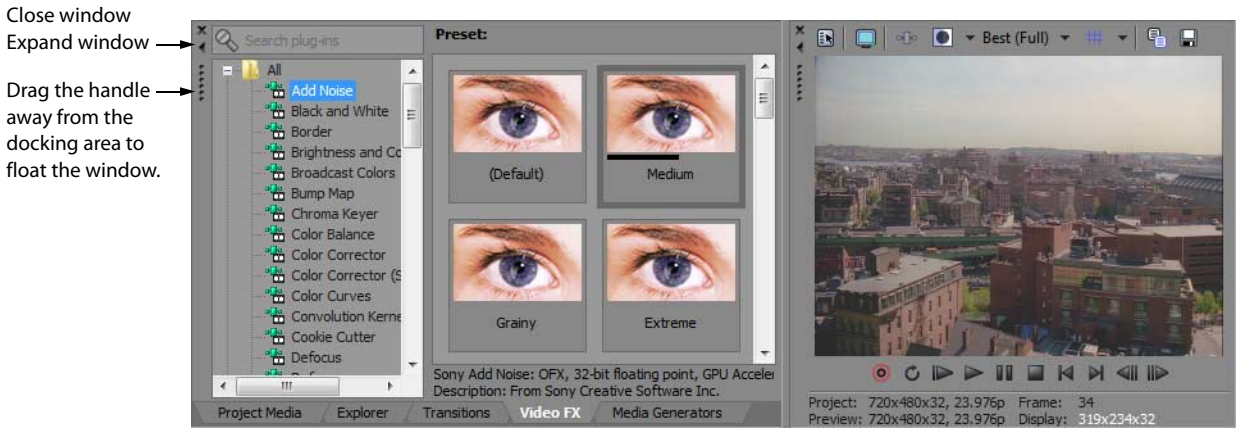
### Scrub control

The scrub control is used to play your project forward or backward for editing purposes. You can adjust the playback speed by setting the speed control marker located beneath the scrub control. *For more information, see* *Scrubbing* *on page* 68.



### Window docking area and floating window docks

By default, the window docking area is located in the upper half of the Vegas Pro workspace. This area allows you to keep frequently used windows available but out of the way while you are working with a project. Windows can be docked next to each other, subdividing the docking area, or they can be docked in a stack in the window docking area or in a separate floating docking window. When stacked, each window has a tab at the bottom with its name on it. Click the window's tab to bring it to the top.



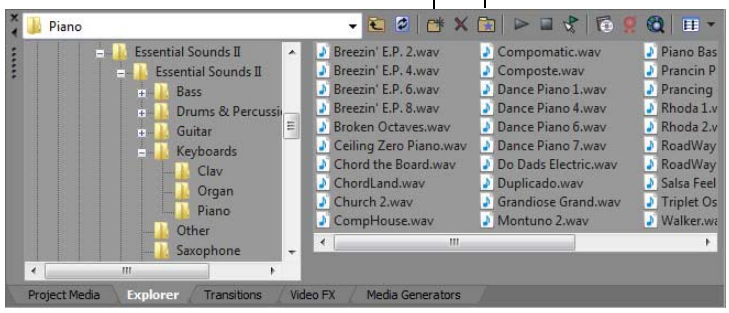

- To dock a window, drag it to the docking area.
- Drag the handle on the left side of a docked window to remove a window from the docking area and float it.
- To prevent a window from docking when you drag it, hold the Ctrl key.
- To expand a docked window so it fills the docking area, click the **Maximize** button (). Click again to restore the window to its previous size.
- To remove a window from the docking area or a floating dock, click the **Close** button ().

#### Display tips:

- *To display the window docking area in the bottom half of the Vegas Pro workspace, clear the* **Display timeline at bottom of main window** *check box on the* **Display** *tab of the Preferences window.*
- *To display the tabs at the top of the window docking area rather than the bottom, select the* **Position tabs at top of docked windows** *check box on the* **Display** *tab of the Preferences window.*
- *To hide the window docking area, select the* **Automatically hide docking area** *check box on the* **Display** *tab of the Preferences window.*
- *For more information, see* *Display tab on page 428*.

### Explorer window - Alt+1

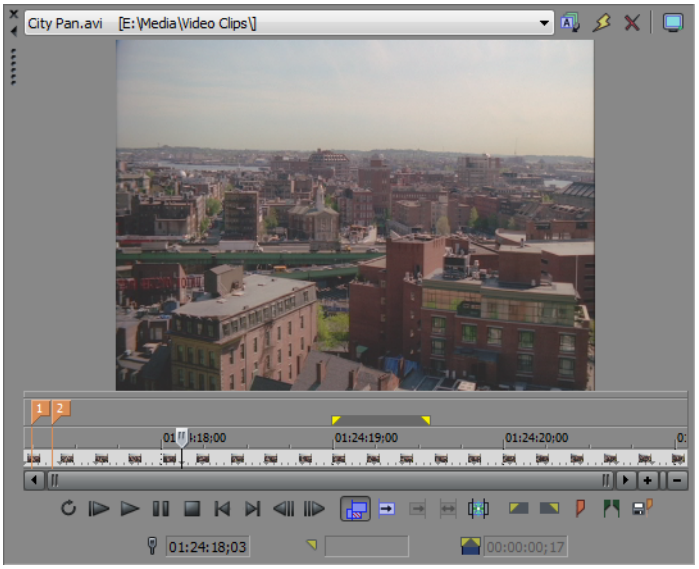
The Explorer window is similar to the Microsoft Windows Explorer. Use the Explorer window to select media files to drag to the project timeline or add to the Project Media window. You can also use the Explorer to perform common file management tasks such as creating folders, renaming files and folders, and deleting files and folders. Use the **Start Preview** ( ) and **Auto Preview** ( ) buttons to preview files before adding them to the project.




| | |
|---|---|
| | Move up the folder list to the next highest folder |
| | Refresh the current view |
| | Create a new folder |
| | Delete selected file(s) |
| | Add selected file to My Favorites list in address bar |
| | Start preview |
| | Stop preview |
| | Enable automatic preview |
| | Use Gracenote MusicID service to locate matching CD information |
| | Edit and submit CD information to Gracenote |
| | Get media from the Web for use in project |
| | Change the display view |

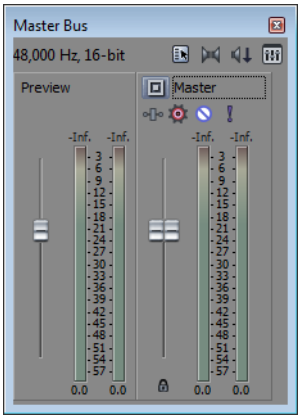
### Trimmer window - Alt+2

The Trimmer window is a good place to edit any media file. When a media file is placed in the Trimmer window, you can place portions of the file on separate tracks by dragging and dropping. *For more information, see Using the Trimmer window on page 108.*



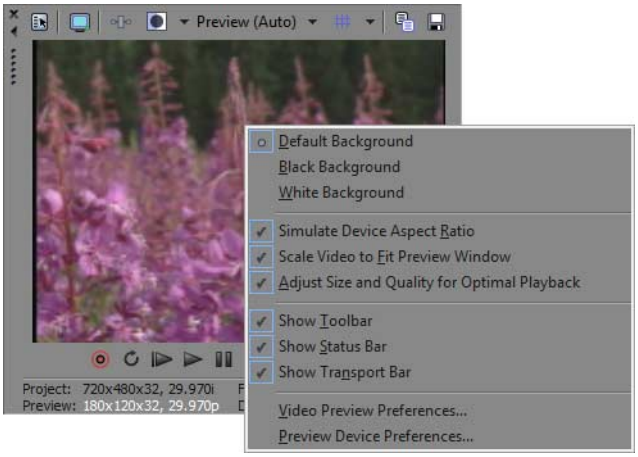
### Master Bus window - Alt+3

The Master Bus window provides you with a streamlined view of your project's master output. *For more information, see Master Bus window on page 191*.




### Video Preview window - Alt+4

This window displays a project's video during project editing and playback. *For more information, see Previewing and Analyzing Video on page 345*.

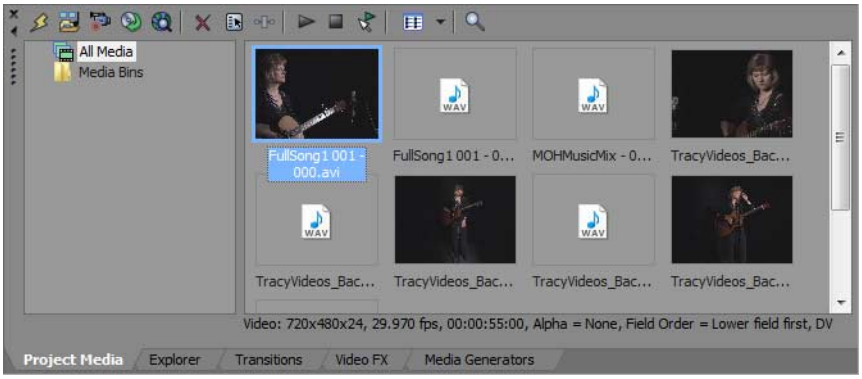



Video appears during project playback or as the cursor is moved during editing.

Right-click to change Video Preview settings.

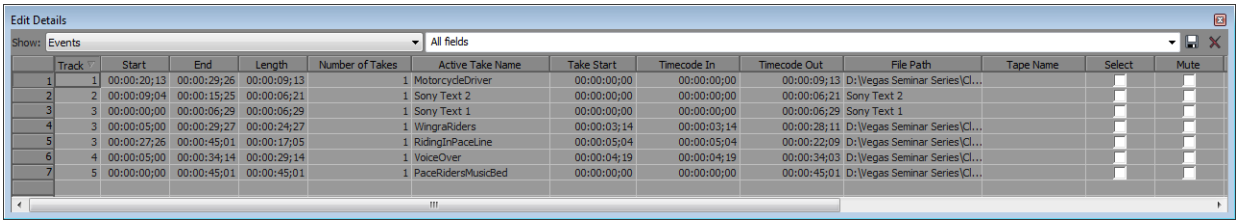
### Project Media window - Alt+5

The Project Media window helps you organize the media files you're using in a project. The information about these files is displayed in a highly flexible database that can be instantly sorted. You can also use the Project Media window to apply effects and plug-ins to media files and set the specific properties of these files. *For more information, see Using the Project Media window on page 42*.



### Edit Details window - Alt+6

This window serves as a highly detailed and customizable database of all of the events in a project. The database can be organized and sorted according to a large number of attributes. *For more information, see Using the Edit Details window on page 114.*




| | Track | Start | End | Length | Number of Takes | Active Take Name | Take Start | Timecode In | Timecode Out | File Path | Tape Name | Select | Mute |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 00:00:20;13 | 00:00:29;26 | 00:00:09;13 | 1 | MotorcycleDriver | 00:00:00;00 | 00:00:00;00 | 00:00:09;13 | D:\Vegas Seminar Series\Cl... | | | |
| 2 | 2 | 00:00:09;04 | 00:00:15;25 | 00:00:06;21 | 1 | Sony Text 2 | 00:00:00;00 | 00:00:00;00 | 00:00:06;21 | Sony Text 2 | | | |
| 3 | 3 | 00:00:00;00 | 00:00:06;29 | 00:00:06;29 | 1 | Sony Text 1 | 00:00:00;00 | 00:00:00;00 | 00:00:06;29 | Sony Text 1 | | | |
| 4 | 3 | 00:00:05;00 | 00:00:29;27 | 00:00:24;27 | 1 | WingraRiders | 00:00:03;14 | 00:00:03;14 | 00:00:28;11 | D:\Vegas Seminar Series\Cl... | | | |
| 5 | 3 | 00:00:27;26 | 00:00:45;01 | 00:00:17;05 | 1 | RidingInPaceLine | 00:00:05;04 | 00:00:05;04 | 00:00:22;09 | D:\Vegas Seminar Series\Cl... | | | |
| 6 | 4 | 00:00:05;00 | 00:00:34;14 | 00:00:29;14 | 1 | VoiceOver | 00:00:04;19 | 00:00:04;19 | 00:00:34;03 | D:\Vegas Seminar Series\Cl... | | | |
| 7 | 5 | 00:00:00;00 | 00:00:45;01 | 00:00:45;01 | 1 | PaceRidersMusicBed | 00:00:00;00 | 00:00:00;00 | 00:00:45;01 | D:\Vegas Seminar Series\Cl... | | | |

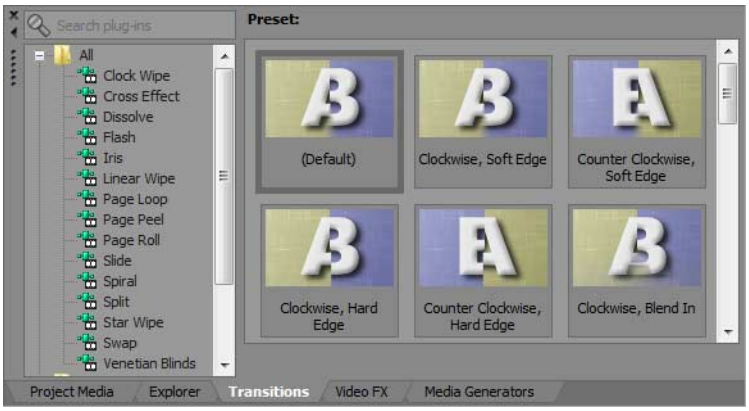
### Transitions window - Alt+7

From the **View** menu, choose **Transitions** to display or hide the Transitions window. Use this window to choose and preview transition effects that you can use to control how a video event begins or ends, or to change the way one event flows into another.

The left pane lists each of the available transitions organized in folders. Click the **Expand** (⊞) and **Collapse** (⊟) buttons to open and close the folders, and select a plug-in name. The thumbnail images in the right pane represent each of the existing presets for the selected transition. Hover your cursor over a preset to see an animated example.

> **Tip:** *You can type in the* **Search plug-ins** *box to find plug-ins. For example, if you wanted to find a specific color-correction plug-in, you could type "color" in the box to display only plug-ins that include the term "color" in the plug-in name, description, or group name.*

*For more information, see Understanding basic transitions on page 323.*



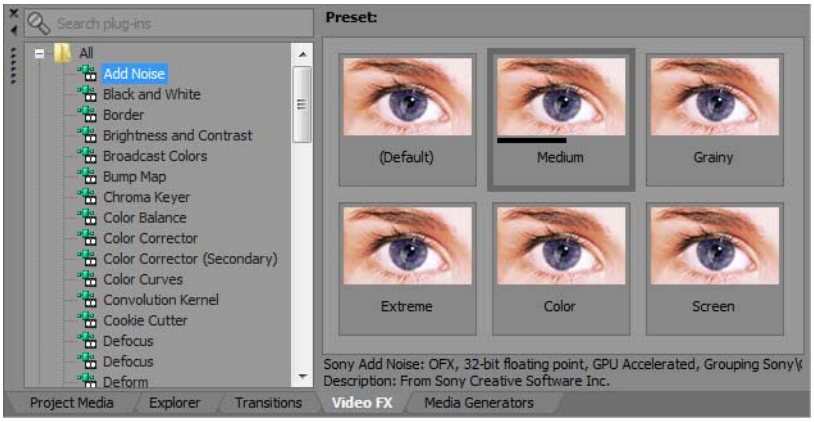
### Video FX window - Alt+8

From the **View** menu, choose **Video FX** to toggle the display of the Video FX window.

The left pane lists each of the available video effects organized in folders. Click the **Expand** (⊞) and **Collapse** (⊟) buttons to open and close the folders, and select a plug-in name. The thumbnail images in the right pane represent each of the existing presets for the selected effect. Hover your cursor over a preset to see an animated example.

> **Tip:** *You can type in the* **Search plug-ins** *box to find plug-ins. For example, if you wanted to find a specific color-correction plug-in, you could type "color" in the box to display only plug-ins that include the term "color" in the plug-in name, description, or group name.*

You can drag a preset thumbnail to a track, event, or to the Video Preview window to apply the effect. *For more information, see* *Applying video effects on page 301*.



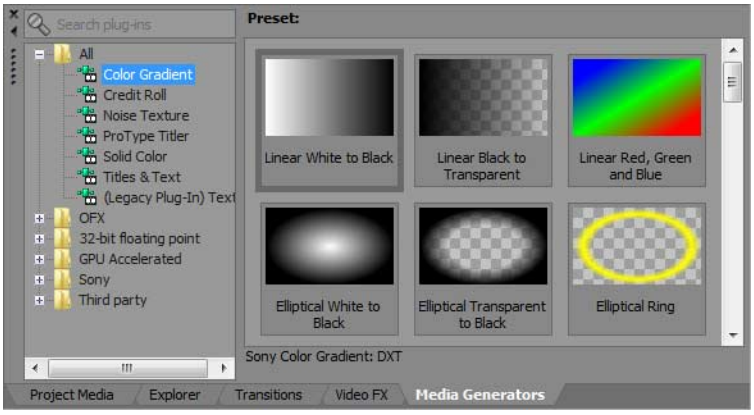

### Media Generators window - Alt+9

From the View menu, choose Media Generators to toggle the display of the Media Generators window. You can use this window to add text, titles, backgrounds, and other generated media.

The left pane lists each of the available media generators organized in folders. Click the **Expand** (⊞) and **Collapse** (⊟) buttons to open and close the folders, and select a plug-in name. The thumbnail images in the right pane represent each of the existing presets for the selected generator. Hover your cursor over a preset to see an animated example.

> **Tip:** *You can type in the* **Search plug-ins** *box to find plug-ins. For example, if you wanted to find a specific color-correction plug-in, you could type "color" in the box to display only plug-ins that include the term "color" in the plug-in name, description, or group name.*

You can drag a preset thumbnail to a track to add media. *For more information, see* *Using generated media on page 305*.



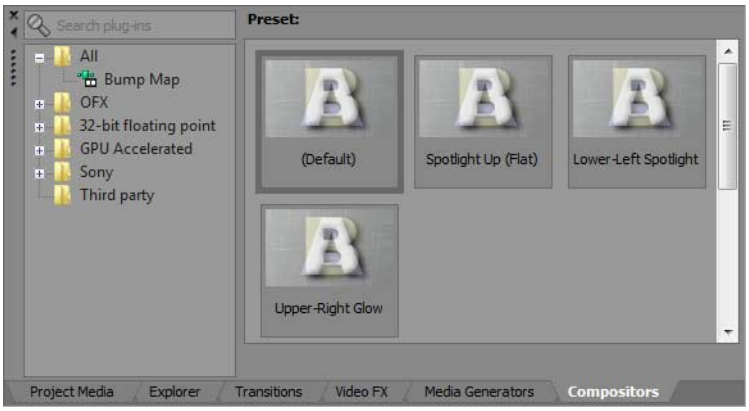
### Compositors window

From the **View** menu, choose **Compositors** to toggle the display of the Compositors window. You can use this window to add compositing effects.

The left pane lists each of the available compositors organized in folders. Click the **Expand** (⊞) and **Collapse** (⊟) buttons to open and close the folders, and select a plug-in name. The thumbnail images in the right pane represent each of the existing presets for the selected compositor. Hover your cursor over a preset to see an animated example.

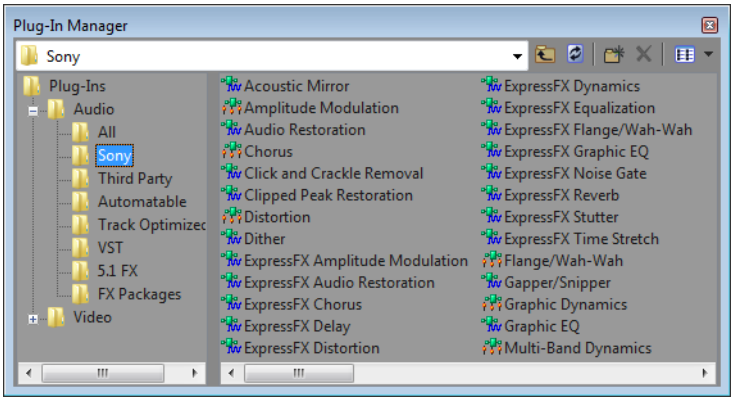
> **Tip:** *You can type in the* **Search plug-ins** *box to find plug-ins. For example, if you wanted to find a specific color-correction plug-in, you could type "color" in the box to display only plug-ins that include the term "color" in the plug-in name, description, or group name.*

You can drag a preset thumbnail to a track to add media. *For more information, see Compositing on page 306 and 3D compositing on page 310.*




### Plug-In Manager window - Ctrl+Alt+1

This window organizes all of the plug-ins available, including video and audio effects, media generators, and transitions. The plug-ins, which are organized in a folder structure, can be dragged into the project. *For more information, see Using audio effects on page 227 or Applying video effects on page 301.*

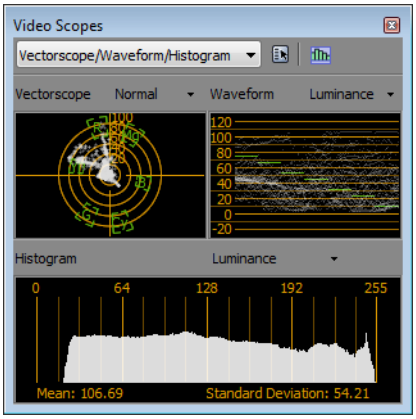


### Video Scopes window - Ctrl+Alt+2

This window allows you to monitor your broadcast video for image problems.

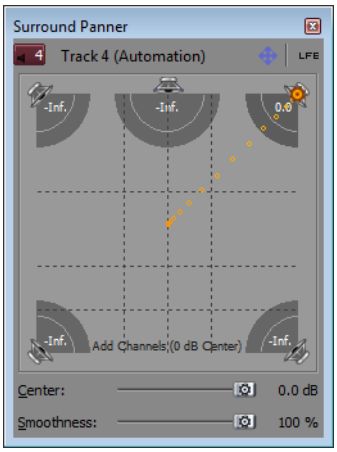
Use the scopes to analyze the your video and adjust accordingly with the Brightness and Contrast, Broadcast Colors, Color Corrector, Color Corrector (Secondary), and Levels plug-ins before rendering.

*For more information, see Monitoring video with scopes on page 351.*




### Surround Panner window - Ctrl+Alt+3

This window allows you to control panning in a 5.1 surround project. You can also display the Surround Panner window by double-clicking the surround panner on a track header or Mixing Console channel strip. *For more information, see Working with 5.1 Surround on page 247.*

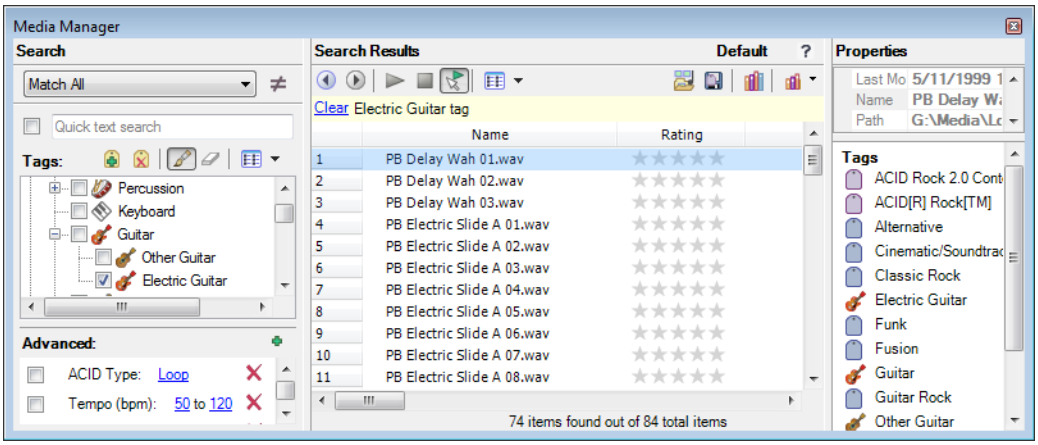


### Media Manager window - Ctrl+Alt+4

If you've installed the Media Manager™, you can use it to search for media and manage your collection of audio and video media so you can find just the right media for your Vegas Pro projects.

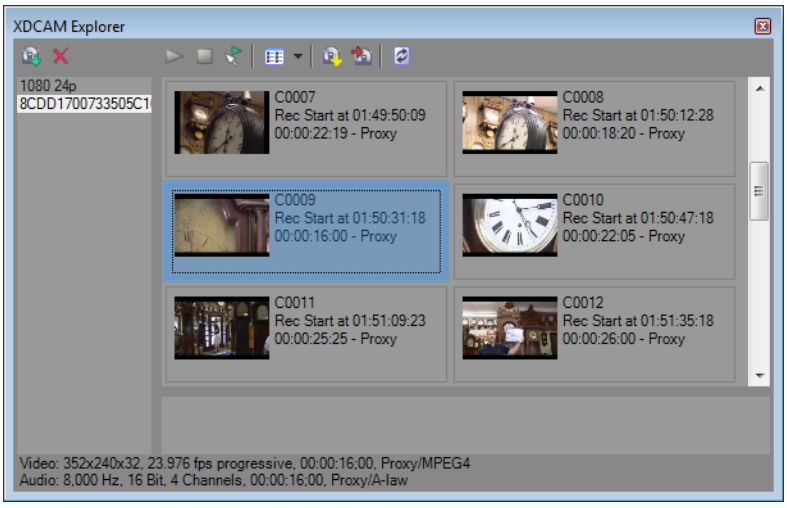
The Media Manager maintains a database of your media, including file attributes, ACID metadata, and tags that you can assign to classify your media.

> **Note:** *When the* **Enable Media Manager** *check box on the* **General** *tab of the Preferences dialog is selected, the Media Manager will start when you start Vegas Pro.*
>
> *Clear the check box to turn off the Media Manager and prevent it from starting with the application. If you're not using the Media Manager, you may want to turn it off to conserve processing power or memory.*



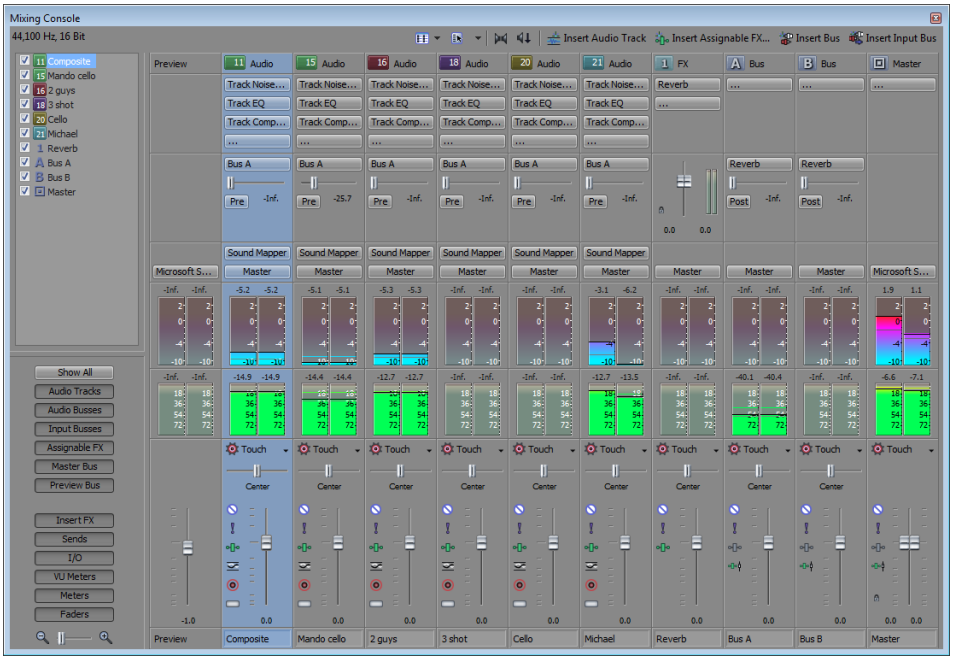

### XDCAM Explorer window - Ctrl+Alt+5

This window displays the XDCAM Explorer window, which you can use to locate, import, and export XDCAM clips. *For more information, see Working with XDCAM Video on page 133.*



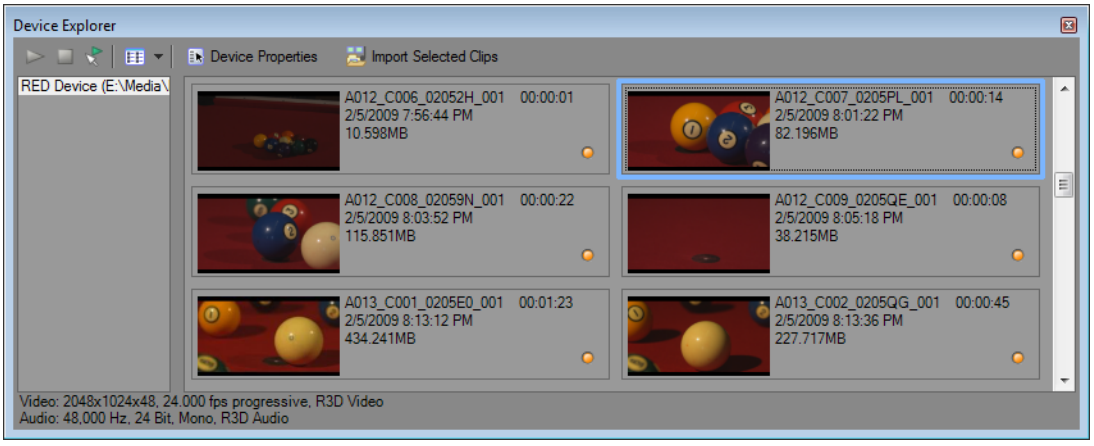
### Mixing Console window - Ctrl+Alt+6

This window displays the Mixing Console, which provides an integrated view of all tracks and busses in your project using the appearance of a traditional hardware-based mixer. *For more information, see Mixing Console window on page 193.*




### Device Explorer window - Ctrl+Alt+7

The Device Explorer window allows you to browse and import clips from AVCHD, XDCAM EX, NXCAM, and RED ONE devices; CompactFlash-based memory recording units such as the HVR-MRC1; and hard-disk-based recording units such as the HVR-DR60. *For more information, see Using the Device Explorer on page 60.*



### Saving and recalling window layouts - Ctrl+Alt+D or Alt+D

A window layout stores the sizes and positions of all windows and floating window docks in the Vegas Pro workspace. You can store up to ten window layouts so you can quickly recall customized layouts for specific editing tasks. *For more information, see Saving and recalling window layouts on page 410.*

### Cursor indications

The cursor changes depending on which functions are available.

| Cursor | Indicates | Modifier | Description |
|---|---|---|---|
| | Standard | none | This is the standard arrow cursor that means events can be dragged. |
| | Trim | none | Position the cursor over the edge of an event and drag to trim the event shorter or longer. |
| | Slip Trim | Alt | Position the cursor over the edge of an event, press Alt, and drag to trim. The media within the event moves with the edge. This is useful to preserve the beginning or end of an event while trimming. |
| | Stretch | Ctrl | Position the cursor over the edge of an event, press Ctrl, and drag the edge to stretch or compress it. This makes the media in the event play slower or faster. |
| | Slip | Alt | Press Alt and drag on the middle of a clip to move the media within the event without moving the event itself. |
| | Trim Adjacent | Ctrl+Alt | Position the cursor over the boundary between two adjacent events, press Ctrl+Alt, and drag. Both events are edge trimmed simultaneously. |
| | Slide | Ctrl+Alt | Position the cursor over the middle of an event, press Ctrl+Alt, and drag to simultaneously trim both ends. |
| | Slide Crossfade | Ctrl+Alt | Position cursor over a crossfade, press Ctrl+Alt, and drag on a crossfade to move it. |

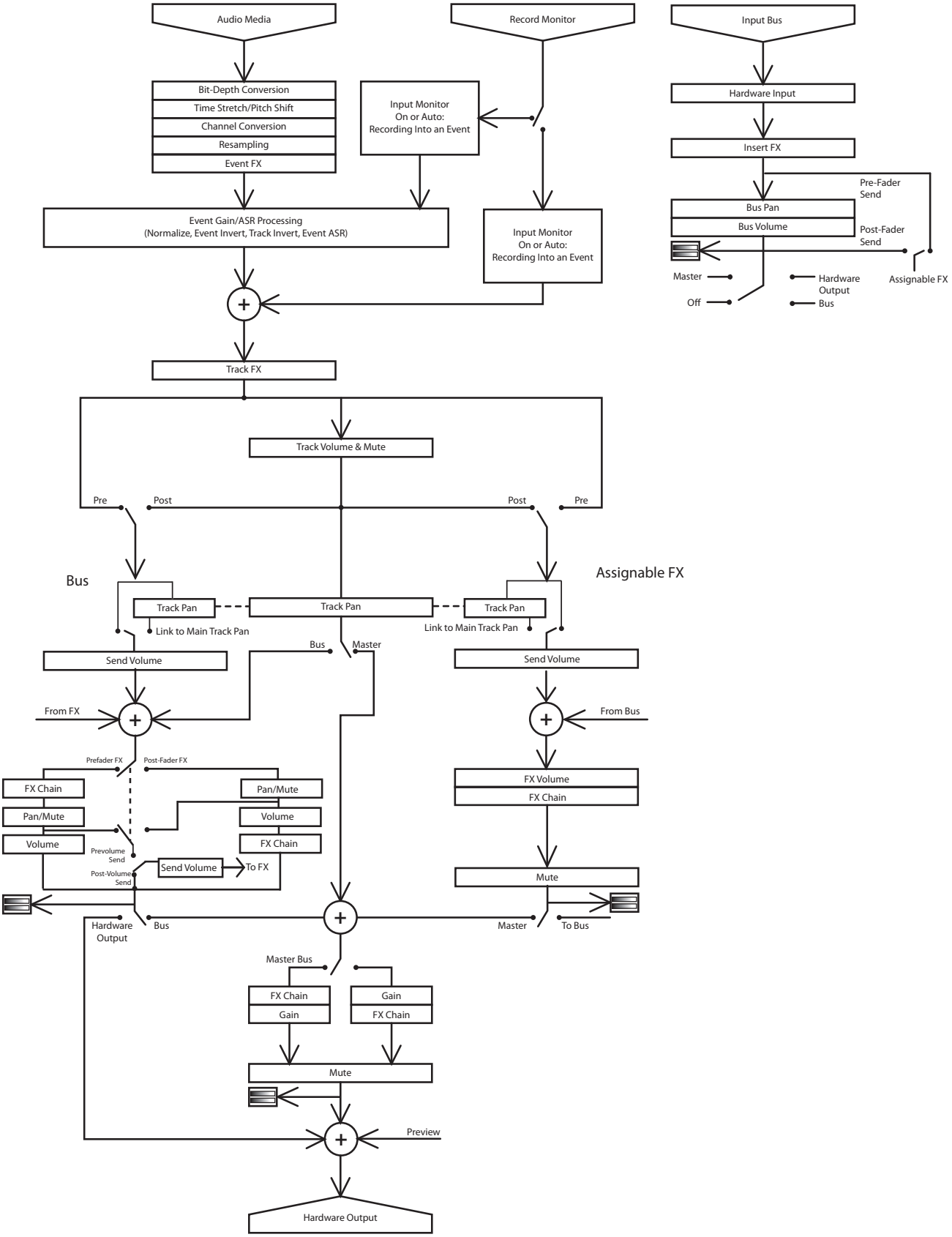
### Using a control surface

A control surface is a hardware device that uses knobs, faders, and buttons to control user interface elements that are normally controlled with a mouse. Using a control surface lends a tactile feel to your editing sessions.

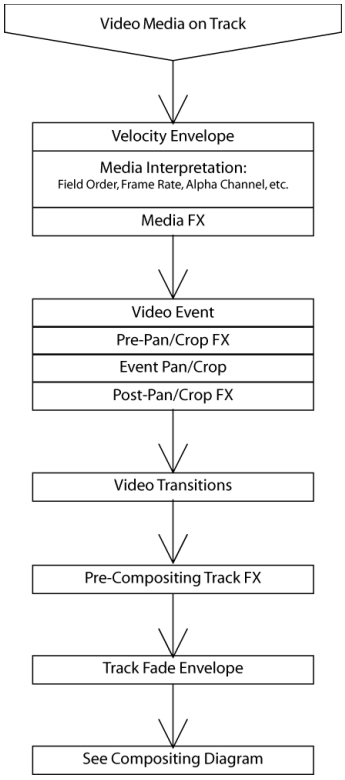
Unlike keyboard shortcuts—which determine the shortcut's behavior based on the portion of the Vegas Pro window that has focus—a control surface's mapped functions work no matter what part of the application has focus.

You can use one Mackie® Control Universal or up to five generic control surfaces with Vegas Pro software. *For more information about setting up a control surface, see External Control & Automation tab on page 430.*

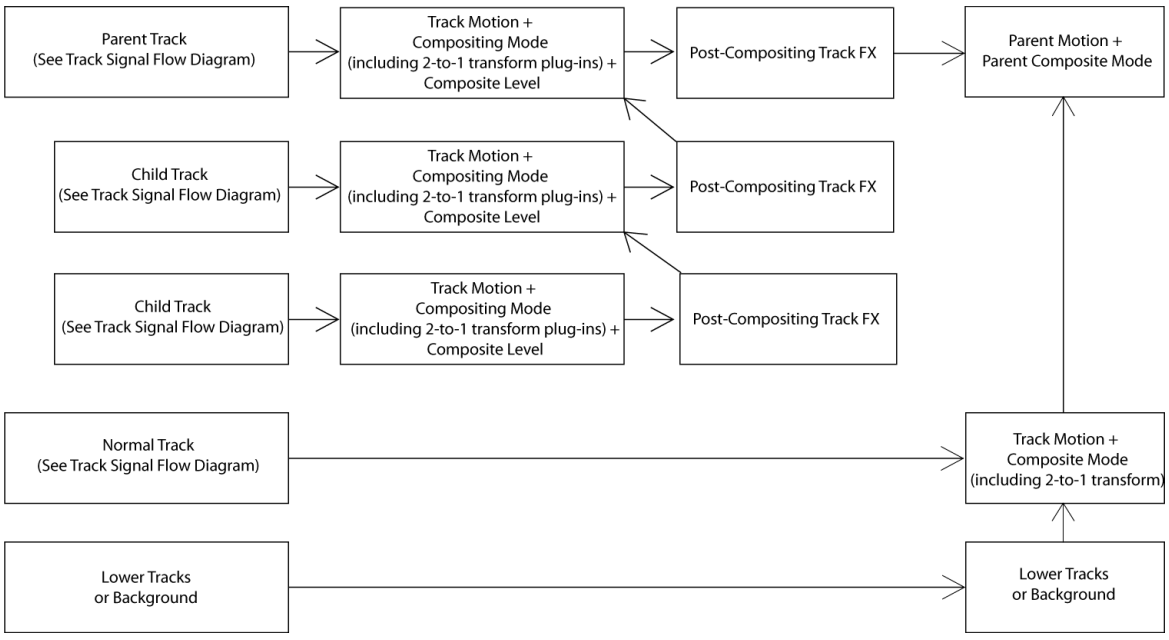
## Audio signal flow



## Video signal flow




Track signal flow




Composited track signal flow

Chapter 2

# Getting Started

Vegas® Pro software is a new way of creating multimedia productions. Whether you are an experienced multimedia author or a budding novice, the powerful features and capabilities of Vegas Pro software are organized to increase your creativity and productivity. The following chapter summarizes the software's basic functions and operations.

## Creating projects

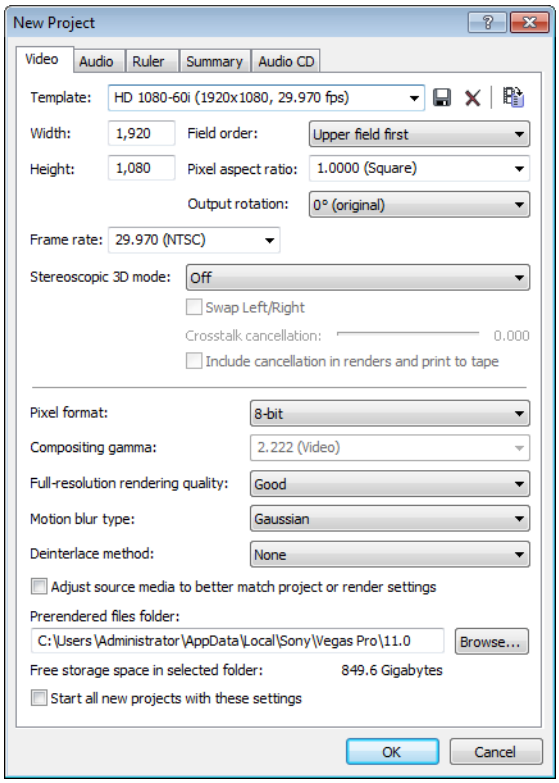
The process of creating a multimedia production can be a complicated undertaking, involving hundreds of shots, takes, voiceovers, music beds, audio tracks, and special effects. Organization is a critical issue in this process. In the software, organization is handled by a small project file (.veg) that saves information about source file locations, edits, cuts, insertion points, transitions, and special effects. This project file is not a multimedia file, but is instead used to create (render) the final file when editing is finished.

Because Vegas Pro software edits a project file and not the original source files, you can edit without worrying about corrupting your source files. This not only gives you a strong sense of security, but it also gives you the freedom to experiment.

### Starting a new project

1. From the **File** menu, choose **New**. The New Project dialog appears.

> **Note:** *The first time you run the software, a new project will automatically be started for you.*



2. Enter your project settings on the various tabs.

   *For more information, see Working with project properties on page 406.*

   - The **Video** tab allows you to select the video format and other video parameters.
   - The **Audio** tab allows you to set up the basic audio settings.
   - The **Ruler** tab allows you to choose the way the ruler is delineated (beats, seconds, etc.).
   - The **Summary** tab allows you to enter any relevant information and reminders about your project.
   - The **Audio CD** tab allows you to enter information for burning audio CDs.

> **Tip:** *The easiest way to set the often-complex properties on the* **Video** *tab is to select a template that matches your media (for example, NTSC DV (720x480, 29.970 fps)).*

3. Click **OK**.
4. From the **File** menu, choose **Save**. Type a name, browse for a location, and click **Save** to save your project (.veg file).

You can change project settings at any time while working on a project. From the **File** menu, choose **Properties** to change any of these settings.

### Setting video properties based on a media file

You can automatically set your project video properties to match an existing video file.

1. From the **File** menu, choose **Properties**.
2. On the Video tab of the Project Properties dialog, click the **Match Media Settings** button ( ).
3. Browse for a media file that has the settings you wish you use for the project.
4. Click **Open**.

   The frame size, frame rate, pixel aspect ratio, and field order of this file are automatically detected and the project properties are set to match.

> **Tip:** *To save this information for future use, type a name in the* **Template** *box and click the* **Save Template** *button ( ). If your projects typically use these settings, select the* **Start all new projects with these settings** *check box.*

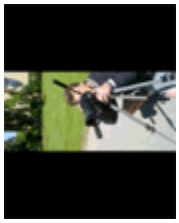
5. Click **OK** to save the new project properties.

### Working with rotated projects

The use of rotated displays—monitors that display vertical media—has become increasingly popular: you can see them in kiosks, presentations, and even on the nightly news. If you have a project that you'd like to display in a rotated format, Vegas Pro makes it easy.

1. Create a new project. *For more information, see Starting a new project on page 37.*
2. Set your project properties as needed, and then choose a setting from the **Output rotation** drop-down list to indicate the orientation of your destination display device. If you want to display your project in portrait (tall) mode, choose **90° clockwise** or **90° counterclockwise**.

In the example to the left, the video was shot with the camera tripod rotated 90 degrees. However, because neither the project or the media has been rotated, the video is displayed sideways within the standard landscape frame.



After choosing **90° clockwise** from the **Output rotation** drop-down list, the Video Preview window is rotated (see example to the left). Because the media hasn't been rotated yet, it doesn't match the project orientation and is letterboxed within the frame.

3. Add your media files to your project. *For more information, see Getting media files on page 41.*
4. Edit the properties for each of your media files to set its rotation as needed:
   a. Right-click a media file in the Project Media window and choose **Properties** from the shortcut menu. The Media Properties dialog is displayed.
   b. Choose a setting from the **Rotation** drop-down list to indicate the direction you want to rotate your media.

After choosing **90° clockwise** from the **Rotation** drop-down list, the media is rotated, and the video fills the frame.

   c. Click **OK** to close the Media Properties dialog and save your changes.

> **Tip:** *To rotate multiple files quickly, select them in the Project Media window, right-click a selected file, and then choose* **Rotate 90° Clockwise** *or* **Rotate 90° Counterclockwise** *from the shortcut menu.*

5. Drag your clips from the Project Media window to the timeline to create events.
6. Edit your project as needed.

7. Render your project to any supported rendering format. *For more information, see Rendering a project on page 363.*

   In the Render As dialog, select the **Use project output rotation setting** check box if you want to use the **Output rotation** setting from the Project Properties dialog for your rendered file. When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated—you can use this setting to proof your project on an unrotated display.

**Tip:** *To render a portrait-oriented file for viewing on a computer, you can create a rendering template that matches the proportions of your project:*

a. *Right-click the Video Preview window and ensure* **Simulate Device Aspect Ratio** *is selected.*
b. *Next, adjust the size of the Video Preview window to a comfortable preview frame size and note the* **Display** *dimensions in the lower-right corner of the Video Preview window.*
c. *From the* **File** *menu, choose* **Render As***, choose the desired rendering format from the* **Save as type** *drop-down list, and then choose a rendering template that's close to the frame size you noted in step b.*
d. *Click the* **Custom** *button, and then use the* **Video** *tab in the Custom Template dialog to adjust the frame size to match the dimensions you noted in step b.*
e. *Save your template for later use.*
f. *Clear the* **Use project output rotation setting** *check box and render your file.*

### Saving a project

When you save your work, it is saved in a project file. Project files are not rendered media files.

1. From the **File** menu, choose **Save**.

   The first time you save a project, the Save As dialog appears. In subsequent saves, the dialog is bypassed, your existing file name is retained, and your project is updated to include any implemented changes.
2. Select the drive and folder where you want to store the project.
3. Type the project name in the **File Name** box.
4. Click **Save**.

**Tip:** *Select the* **Copy and trim media with project** *check box to save the project file and copies of the media files to a common location. For more information, see Renaming or creating a copy of a project (using Save As) on page 361.*

### Renaming a project (using Save As)

After you have been working with your project, you can use the **Save As** command in the **File** menu to save a copy of a project with a new name. This is useful for backing up different versions of a project.

*For more information, see Renaming or creating a copy of a project (using Save As) on page 361.*

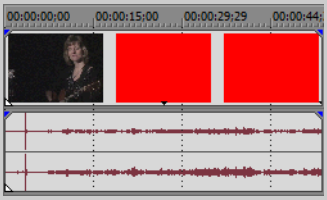
## Getting media files

You can add media from a variety of sources to your project. You can add audio and video files, record audio into a track, capture video from a video camera, or extract music from your own CD. You can also create media such as text overlays, backgrounds, and credit rolls from within the software. *For more information, see Using generated media on page 305.*

Vegas Pro software supports a wide range of media file types. There are multiple ways to locate and add files to your Vegas Pro project, as discussed in the following sections.

**Notes:**

- *To have pulldown fields automatically removed when opening 24 fps progressive-scan DV video files, select the* **Allow pulldown removal when opening 24p DV** *check box on the* **General** *tab of the Preferences dialog. To open your 24p DV video files as 29.97 fps interlaced video (60i), clear this check box.*
- *When you add an ACID loop to the timeline, it is automatically stretched to match the project tempo as specified on the* **Ruler** *tab of the Project Properties dialog. If you want to ignore tempo information, clear the* **Import audio at project tempo** *check box on the* **Audio** *tab of the Preferences dialog. For more information on project properties, see Working with project properties on page 406. For more information on preferences, see Setting preferences on page 413.*
- *When you add a multichannel audio file (.wav/.wav64, .avi, .mxf, ATRAC, and BWF) to your project, the audio is added across tracks. For example, if you import a four-channel WAV file, the audio will be added to four adjacent tracks. For control over which channels are used by each event, right-click a multichannel audio event, choose* **Channels** *from the shortcut menu, and choose a command from the submenu. For more information, see Adjusting audio channels on page 182.*
- *When you add a multistream audio file to your project, you can choose which stream you want to use by right-clicking the event, choosing* **Stream** *from the shortcut menu, and then choosing a stream from the submenu.*
- *5.1-channel audio from DVD camcorders will be downmixed to stereo when importing into a stereo project. When importing into a 5.1 surround project, audio will be added to separate tracks for the center, front, rear, and LFE channels.*
- *If Vegas Pro cannot read frames in a video event, they will be displayed in red in the timeline. Those frames will be black in the Video Preview window and the rendered output.*




- *If you want to use RAW camera files in your project, the Microsoft Camera Codec Pack will allow you to view RAW camera files and add them to the timeline. For more information, see http://www.microsoft.com/download/en/details.aspx?id=26829.*

### Previewing a media file

You can preview files before placing them in your project. The Explorer window has a mini-transport bar with **Play** (), **Stop** (), and **Auto Preview** () buttons. When you preview a file, its stream is sent to the Mixer window's preview bus (for audio files) or to the Video Preview window (for video files).

**Tip:** *You can use the same mini-transport bar buttons in the Project Media window to preview files in the Project Media list.*

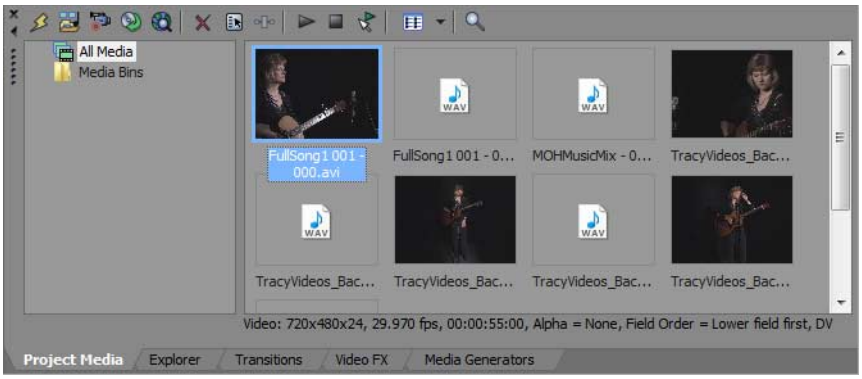
1. Select a file in the Explorer window.
2. Click the **Play** button () to listen to the file.
3. Click the **Stop** button () or select a different file to stop previewing the file.

**Tip:** *To automatically preview selected files, click the* **Auto Preview** *button () on the Explorer window's transport bar.*

**Note:** *Video is previewed in the Trimmer window. If you want to preview video in the Video Preview window, right-click the Trimmer window and clear the* **Show Video Monitor** *command.*

## Using the Project Media window

Media files, both video and audio, tend to be the largest files on your hard drive. It is therefore not always easy to move them around and impractical to store multiple copies of these files. You can add media files to the Project Media window to organize them before any editing begins. Once you begin working on a project, all files you add to the timeline are automatically included in the Project Media list. From the **View** menu, choose **Project Media** to open this window if it is not already visible.




### Using Project Media views

You can control the information that is displayed in the Project Media window by clicking the **Views** button ( ) and selecting a view. The purpose of each view is explained below.

| View | Description |
|---|---|
| **List** | Displays a simple listing of the file name of each file in the Project Media window. |
| **Detailed** | Displays all the properties for each file. The information is presented in a table format. You can customize the information displayed:<br>• Reorder columns (fields) by dragging the column label to a new position.<br>• Hide a column by dragging the column label off of the Project Media window. To display a hidden column, right-click the Project Media window, choose **View** from the shortcut menu, and choose the column name from the submenu.<br>• Sort the files in the Project Media list according to a category by clicking the column label for that category.<br>• Use the **Comments** field to add your own annotations to a file's entry in the Project Media list. Double-click the field to enter text. This information is saved with the project and is not saved with the media file itself. |
| **Thumbnail** | Displays the first frame of a video file. |

### Adding media to the Project Media list

You can add media to the Project Media list without adding it to the timeline by importing the file. *For more information, see Importing media on page 46.*

### Adding media to the Project Media list from the Explorer window

1. Navigate to and select a file to add to the Project Media list. You can use Ctrl or Shift to select multiple media files.
2. Right-click the file and choose **Add to Project Media list** from the shortcut menu. The selected file is added to the Project Media window.

### Replacing media in the Project Media window

You can replace a file in the Project Media window with a different file. When changing the media file that an event contains, every occurrence of the event on the timeline is updated with the new media file contents.

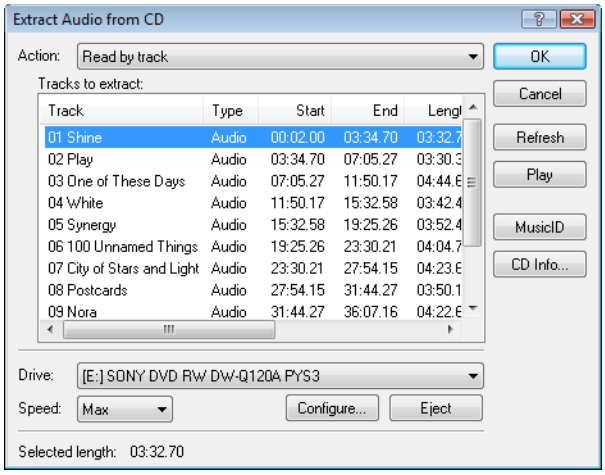
1. Right-click a file in the Project Media window.
2. Choose **Replace** from the shortcut menu.
3. In the Replace Media File dialog, browse for and select the file that you want to replace the current file.
4. Click **Open**. The selected file replaces the old file in the Project Media list, and any events in the timeline containing the old file are updated to contain the new media file.

### Extracting audio from a CD

You can extract tracks from a CD and add them to the Project Media window as .wav files.

**Important:** *Vegas Pro software is not intended for, and should not be used for, illegal or infringing purposes, such as the illegal copying or sharing of copyrighted materials. Using Vegas Pro software for such purposes is, among other things, against United States and international copyright laws and contrary to the terms and conditions of the End User License Agreement. Such activity may be punishable by law and may also subject you to the breach remedies set forth in the End User License Agreement.*

1. Insert the audio CD.
2. In the Project Media window, click the **Extract Audio from CD** button (). The Extract Audio from CD dialog appears.




3. From the **Action** drop-down list, choose the method you want to use for extracting the CD audio:
   - **Read by track** Use this option to choose the tracks you want to extract from the CD.
   - **Read entire disc** Use this option to automatically extract all tracks on the disc. The entire CD is extracted into one new file in the Project Media window.
   - **Read by range** Use this option to extract audio from a specified range of time.
4. If you chose either the **Read by track** or **Read by range** option, specify the tracks or range to extract:
   - For **Read by track**, click the tracks you want to extract in the Tracks to read list. Use the Ctrl or Shift keys to select more than one track. Each track is extracted into a separate file in the Project Media window.
   - For **Read by range**, enter a time in the **Range** start field and either the **Range end** or **Range length** fields. The range of audio is extracted into one new file in the Project Media window.

**Note:** *If you want to extract multiple tracks to a single file, choose* **Read by track** *from the* **Action** *drop-down list to select your tracks, and then choose* **Read by range** *from the* **Action** *drop-down list. The appropriate time range for the tracks you selected will automatically be inserted and the time range will be extracted to a single file.*

5. From the **Drive** drop-down list, choose the drive containing the audio CD from which you want to extract.

6. Click the **MusicID** button if you want to obtain CD information using Gracenote® MusicID.

   If CD information is not available, you can click the **CD Info** button to display a dialog box where you can edit the CD information and submit it for inclusion in the Gracenote Media Database.

7. From the **Speed** drop-down list, choose the speed at which you want to extract the audio. If you experience any problems extracting audio, you can try decreasing the selected speed, or you can click **Configure** to adjust the **Audio extract optimization** setting.

> **Note:** *To eject the CD at any time prior to beginning the extraction process, click the* **Eject** *button.*

8. Click **OK**. The Save As dialog appears.
9. Select a name and location for the new .wav file.
10. Click Save to begin extracting the audio.

    The track is extracted and a progress meter is displayed to indicate the percent complete. When extraction is complete, the new .wav file appears in the Project Media window.

#### Adding a still-image sequence

If you've exported a video clip as a still-image sequence using another application (a 3D-rendering application, for example), the sequence can be added to the Project Media window and treated as a single media file. Each image in the sequence will be displayed for one frame in the event.

1. Click the **Import Media** button ( ) in the Project Media window. The Import Media dialog appears.
2. Choose the folder where the sequence you want to open is stored.
3. Select the first image in the sequence (or the image you want to start the event).
4. Select the **Open still-image sequence** check box.
5. In the **Range** field, enter the number of the last image you want to open. For example, if you'd selected AnimationOne_00001.tga in step 3, you could enter 120 in this box to create a new image sequence using AnimationOne_00001.tga to AnimationOne_00120.tga.
6. Click **Open**. The still-image sequence is added to the Project Media window.

#### Sorting media with bins

The detailed view of the Project Media window helps you sort your media files using their attributes, but for more control, you can create bins. Bins are folders within projects that you can use to organize your media files.

Media bins are virtual folders that are saved with your project. They do not affect the way media is saved on your computer.

##### *Creating bins*

Right-click the parent bin where you want to create a new bin and choose **Create New Bin** from the shortcut menu.

##### *Adding media to a bin*

1. Browse your existing bins to find the media file you want to move. The All Media Folder contains all media files in your project.
2. Drag a file from the right-hand pane to a bin.

##### *Searching media bins*

1. Right-click in the Project Media window and choose **Search Media Bins** from the shortcut menu. The Search Media Bins dialog is displayed.
2. Use the drop-down lists in the Search Media Bins dialog to set your search conditions and click the **Search** button. The selected bin and all sub-bins will be searched.

3. Click the **Search Results** icon to view the matching files.

> **Tip:** *Right-click the* **Search Results** *icon and choose* **Save as Bin** *from the shortcut menu to save the results of your search as a new media bin.*

***Automatically adding recorded files to a media bin***

Select a media bin if you want to automatically add your recorded audio to a media bin.

***Deleting media from a bin***

1. Select a media file.
2. Press Delete on your keyboard.
3. If the **All Media Folder** is selected, the file will be removed from your project.
4. If a media bin is selected, the file is removed from the bin, but remains part of your project. The file is still available in the **All Media Folder**.

**Configuring 24p pulldown removal**

Right-click a DV AVI file in the Project Media window and choose **File Format Properties** from the shortcut menu to edit file settings from the file format plug-in associated with the media file type.

For 24p NTSC DV AVI files with 2-3 pulldown, you can use this dialog to configure removal of pulldown fields.

In most cases, you will not need to edit pulldown removal settings. However, if the settings were not properly set in the DV header when your video was captured, you can fine-tune pulldown removal without recapturing your video.

1. Right-click an AVI file in the Project Media window and choose **File Format Properties** from the shortcut menu. The AVI/DV Media Properties dialog appears.

   This command is not available for non-24p NTSC video or for 24p NTSC video using 2-3-3-2 pulldown.
2. Select the **Enable 2-3 pulldown removal** check box.

> **Note:** *You can clear this check box if you want to override pulldown removal for individual files when the* **Enable pulldown removal when opening 24p DV** *check box is selected on the General tab of the Preferences dialog.*

3. Choose a setting from the **Starting frame timecode offset** drop-down list to indicate what timecode numbers represent which frame in the video sequence.

   For example, if you have an NTSC DV file with 2-3 pulldown created on a Sony JH3 HDCAM deck, the default settings for timecode offset use 0 for the **Starting frame timecode offset**.

   If you have changed the timecode offsets on the deck (or if you have material with pulldown from another source) you will have to experiment with the settings to determine the correct offset.
4. Check for interlacing:
   a. In the **Project Properties** dialog, choose a NTSC DV 24p template from the **Template** drop-down list.
   b. Choose the **Best (Full)** setting in the Video Preview window to show full frames.
   c. Step though the clip and look for interlace lines in moving objects or backgrounds.
   d. If you see interlace lines, repeat from step 3 and choose a different offset value.
   e. When no interlace lines appear, the offset is set correctly.

**Pairing two media files as a stereoscopic 3D subclip**

If you have two files that have synchronized timecode — such as video shot on a 3D camera that creates separate left- and right-eye clips — you don't need to align the audio and video. Just select the clips in the Project Media window and choose **Pair as Stereoscopic 3D Subclip** from the shortcut menu.

If you view the clip properties for the new subclip, you'll see that the **Stereoscopic 3D Mode** is set to **Pair with next stream**.

*For more information, see Stereoscopic 3D Editing on page 123.*

## Importing media

From the **File** menu, choose **Import**, and then choose **Media** from the submenu (or click the **Import** button ( ) in the Project Media window) to add a media file to your project without adding it to the timeline. Vegas Pro supports the importing of a wide variety of file formats, including AAF and Broadcast Wave Format, which are discussed separately below.

1. From the **File** menu, choose **Import**, and then choose **Media** from the submenu. The Import Media dialog is displayed.
2. Choose the folder where the file you want to open is stored:
   - Choose a drive and folder from the **Look in** drop-down list.
   - Choose a folder from the **Recent** drop-down list to quickly select a folder from which you have previously opened files.
3. Select a file in the browse window or type a name in the **File name** box. Detailed information about the selected file is displayed at the bottom of the dialog.

**Notes:**

- *If you select an image from a still-image sequence, you can select the* **Open still-image sequence** *check box to import all images in the sequence as a single entry in the Project Media window. In the* **Range** *box, enter the number of the last image you want to open. For example, if you'd selected AnimationOne_00001.tga in step 2, you could enter 120 in this box to create a new Project Media entry using AnimationOne_00001.tga to AnimationOne_00120.tga.*
- *If you want to use RAW camera files in your project, the Microsoft Camera Codec Pack will allow you to view RAW camera files and add them to the timeline. For more information, see http://www.microsoft.com/download/en/details.aspx?id=26829.*

4. Click **Open**. The file is added to the Project Media window.

## Importing and exporting AAF files

You can use AAF (Advanced Authoring Format) files to exchange projects between applications. For example, if your postproduction facility uses a tool other than Vegas Pro software, you could provide your project as an AAF file.

### Creating an AAF file

If you intend to export your project as an AAF file, note the following usage guidelines and plan your project accordingly:

- Audio and video cuts are preserved.
- Track-based audio gain and panning are preserved when saving or importing AAF files.

  Select the **AAF Export - Use clip-based audio envelope** check box on the **General** tab of the Preferences dialog if you want to combine track and event gain envelopes and save them as clip-based gain envelopes in the AAF file. When the check box is cleared, track envelopes are saved as track envelopes, and event envelopes are saved as clip envelopes.

  When exchanging AAF with another application, refer to its documentation to determine whether audio gain and panning changes are supported.
- Muted audio tracks are not included in the AAF file.
- When you import an AAF file, the track- and clip-based gain envelopes are combined and imported as track envelopes.
- Audio and video effects are ignored.
- All video transitions are exported as AAF Video Dissolve transitions.
- All audio crossfades are exported as AAF Mono Audio Dissolve transitions.
- Time-stretched video is exported using the AAF "Video Speed Control" effect.
- Time-stretched audio is not supported: audio events that are time stretched will play at their original speed, and time is added to the track to represent the stretched duration; audio events that are time compressed will play at the original speed, but the event is trimmed to match the compressed event length.
- Any track that has mono and stereo audio will be ignored; the AAF format does not allow mono and stereo audio on a single track.
- Still images will be exported as 1,080,000 frames (the AAF specification does not allow media with a length and frame rate of 0).

- Track order in your exported AAF will not match your Vegas Pro project: in the Vegas Pro track model, the first track represents the foreground; in the AAF specification, the first track represents the background.
- Audio is exported using frame units when the **AAF Export - Use frame unit for audio** check box is selected on the **General** tab of the Preferences dialog. Clear the check box if you want to use sample units for exported audio (use this setting only if your project contains audio only or if you know the application that will import your AAF supports frame units for video and sample units for audio).

1. From the **File** menu, choose **Save As**. The Save As dialog appears.
2. Select the drive and folder where you want to store the project.
3. Type a name in the **File Name** box.
4. From the **Save as type** drop-down list, choose **Edit Protocol Compliant AAF File (*.aaf)** or **Avid Legacy AAF File (*.aaf)**.
5. Select the **Embed WAVE/AIFC Media** check box if you want to embed audio that uses the wave or AIFC codec with your AAF file.

   This check box is available only if **Edit Protocol Compliant AAF File** is selected from the **Save as Type** drop-down list.

> **Note:** *Only individual audio files that use the wave or AIFC codec will be embedded. Audio streams from video files of audio that does not use the wave or AIFC codec will not be embedded.*

6. Type a name for the file and browse for a destination.
7. Click **Save**.

#### Importing an AAF file into the current project

If you intend to import an AAF file into your current Vegas Pro project, note the following usage guidelines and plan your project accordingly:

- Audio and video cuts are preserved.
- Track-based audio gain and panning are preserved when saving or importing AAF files.

  When you import an AAF file, the track- and clip-based gain envelopes are combined and imported as track envelopes.

  When exchanging AAF with another application, refer to its documentation to determine whether audio gain and panning changes are supported.
- All video transitions are imported as crossfades.
- Audio and video effects are ignored.
- The AAF Video Speed Control effect is preserved and mapped to the Playback rate setting in the imported event's properties.

  *For more information, see Editing in the Event Properties dialog on page 104.*
- If you import an AAF file that has embedded wave or AIFC audio, the files will be extracted to the same folder as the AAF file when you import the project.

1. From the **File** menu, choose **Import**, and then choose **AAF** from the submenu. The Import dialog is displayed.
2. Choose the folder where the project you want to open is stored:
   - Choose a drive and folder from the **Look in** drop-down list.
   - Choose a folder from the **Recent** drop-down list to quickly select a folder from which you have previously opened files.
3. Select a file in the browse window or type a name in the **File name** box.
4. Click **Open**. The AAF file is imported into the current project.

### Importing an AAF file into a new Vegas Pro project

If you intend to import an AAF file into a Vegas Pro project, note the following usage guidelines and plan your project accordingly:

- Audio and video cuts are preserved.
- Track-based audio gain and panning are preserved when saving or importing AAF files.

  When you import an AAF file, the track- and clip-based gain envelopes are combined and imported as track envelopes.

  When exchanging AAF with another application, refer to its documentation to determine whether audio gain and panning changes are supported.
- All video transitions are imported as crossfades.
- Audio and video effects are ignored.
- The AAF Video Speed Control effect is preserved and mapped to the **Playback rate** setting in the imported event's properties. *For more information, see Editing in the Event Properties dialog on page 104.*
- If you import an AAF file that has embedded wave or AIFC audio, the files will be extracted to the same folder as the AAF file when you import the project.

1. From the **File** menu, choose **Open**. The Open dialog is displayed.
2. Choose the folder where the project you want to open is stored:
   - Choose a drive and folder from the **Look in** drop-down list.
   - Choose a folder from the **Recent** drop-down list to quickly select a folder from which you have previously opened files.
3. Select a file in the browse window or type a name in the **File name** box.
4. Click **Open**. If you have not saved the current project, you will be prompted to save your changes.

## Importing Broadcast Wave Format files

You can use Broadcast Wave Format (.bwf) files to exchange audio between audio editors or broadcasting platforms.

Broadcast Wave Format files are similar to standard .wav files, but they contain additional metadata including timestamps that tell the software where to add audio on the Vegas Pro timeline.

**Tip:** *You can also add Broadcast Wave Format files to your project by dragging them from the Explorer window to the timeline. However, if you drag a .bwf file to the timeline, events are created where you drop the file. Using the Import Broadcast Wave Format dialog ensures that events are arranged according to the timestamps in the file.*

1. From the **File** menu, choose **Import**, and then choose **Broadcast Wave Format** from the submenu. The Import Broadcast Wave Format dialog is displayed.
2. Choose the folder where the project you want to open is stored:
   - Choose a drive and folder from the **Look in** drop-down list.
   - Choose a folder from the **Recent** drop-down list to quickly select a folder from which you have previously opened files.
3. Select the files you want to open in the browse window.

   Information about the selected files is displayed at the bottom of the Import Broadcast Wave Format dialog.
4. From the **Arrange** drop-down list, choose a setting to indicate how you want to arrange audio events on the timeline:

| Setting | Description |
|---|---|
| **Add across tracks** | A separate track is created for each .bwf file you import. |
| **Add across time** | All selected .bwf files are added to a single track. |

**Note:** *Audio from multichannel .bwf files is always added across tracks, regardless of the* **Arrange** *setting. For example, if you import a four-channel .bwf file, the audio will be added to four adjacent tracks. For control over which channels are used by each event, right-click a multichannel audio event, choose* **Channels** *from the shortcut menu, and choose a command from the submenu. For more information, see Adjusting audio channels on page 182.*

5. If you chose **Add across tracks** in step 4, choose a setting from the **Order tracks** drop-down list to indicate how you want to arrange the tracks in the track list:

| Setting | Description |
|---|---|
| **By timestamp** | Sorts tracks chronologically using the timestamp in each file.<br>You can display a file's timestamp at the bottom of the Import Broadcast Wave Format dialog by selecting a file. |
| **Alphabetically by filename** | Sorts tracks alphabetically using the names of the files you import. |

6. Choose a setting from the **Positioning** drop-down list to indicate where imported audio will be added to the timeline.

| Setting | Description |
|---|---|
| **Use ruler time** | Adds each imported file to the Vegas Pro timeline at the exact position indicated by its timestamp. For example, if you import a .bwf file with a timestamp of 00:00:30;00, the media would be added to the timeline at the thirty-second mark on the ruler. |
| **Relative to cursor** | Adds each imported file to the Vegas Pro timeline and offsets the timestamp value by the cursor position. For example, if you position the cursor at 00:00:10;00 before importing a .bwf file with a timestamp of 00:00:30;00, the media would be added to the timeline at the forty-second mark on the ruler. |

7. Click **Open**. The selected files are imported and added to the timeline of the current project.

### Importing video from a DVD camcorder

You can use Vegas Pro software to import video from a finalized Sony® DVD Handycam® camcorder disc.

**Important:**

- *Before importing video, you'll need to finalize the disc. For information about finalizing a disc, refer to your camcorder's documentation.*
- *5.1-channel audio will be downmixed to stereo when importing into a stereo project. When importing into a 5.1 surround project, audio will be added to separate tracks for the center, front, rear, and LFE channels.*

1. Place the DVD you want to import in your computer's DVD drive or connect your camcorder to your computer via USB.

**Important:** *The Sony Handycam USB driver that is included with DVD-based camcorders can prevent Vegas Pro from recognizing a USB-connected camera. If you use the Add/Remove Programs Control Panel to uninstall the "Sony DVD Handycam USB driver" component, Vegas Pro will be able to connect to the camera and import video.*

2. From the **File** menu, choose **Import**, and then choose **DVD Camcorder Disc** from the submenu. The Import DVD Camcorder Disc dialog is displayed.
3. From the **Source** drop-down list, choose the disc that contains the video you want to import.
4. The **Destination** box displays the folder where the video will be imported. Click the **Browse** button if you want to choose a different folder.
5. Click the **OK** button to start importing video.

After importing is complete, the video from the disc is added to the Project Media window. Each chapter is imported as a separate file. You can then add the imported video to your project just like any other media file.

### Working with AVCHD video

You can edit files recorded with AVCHD camcorders just like any other supported media type on the timeline.

This section will guide you through the process of using AVCHD video in your Vegas Pro project.

**Note:** *5.1-channel audio will be downmixed to stereo when importing into a stereo project. When importing into a 5.1 surround project, audio will be added to separate tracks for the center, front, rear, and LFE channels.*

1. Shoot your video with a Sony AVCHD camcorder.
2. Use the Device Explorer to browse and import clips (.m2ts files) from your camera to your local hard drive. *For more information, see Using the Device Explorer on page 60.*
3. Start a new Vegas Pro project, and set your project properties to the format that most closely matches your desired output format. *For more information, see Modifying project video properties on page 282.*

   For example, if you intend to burn the video to an NTSC DVD, choose **NTSC DV (720x480, 29.970 fps)** from the **Template** drop-down list on the Video tab of the Project Properties dialog. If you want to create a 4.8 Mbps high-definition Windows Media Video file, choose **HDV 720-24p (1280x720, 23.976 fps)**.
4. Add the AVCHD files that you copied in step 2 to your project. *For more information, see Getting media files on page 41.*
5. Drag your clips from the Project Media window to the timeline to create events.
6. Edit your project as needed. *For more information, see Editing events on page 76.*
7. Render your project to any supported rendering format. *For more information, see Rendering a project on page 363.*

**Note:** *If you want to render to AVCHD format and export the rendered file to an AVCHD camera, use the following steps:*

a. *Verify that your Vegas Pro project is set to 5.1 surround mode.*
b. *In the Render As dialog, choose* **Sony AVC** *from the* **Save as type** *drop-down list.*
c. *Use the* **AVCHD NTSC 5.1 Surround** *or* **AVCHD PAL 5.1 Surround** *rendering template.*
d. *If you choose to use the Custom Template dialog to customize your rendering template, leave all settings at their default values except for the* **Bit rate** *control. The default Bit rate setting should work for most applications.*
e. *To save the rendered file to your camera, you'll need to use the software that was supplied with your camera.*

**Tip:** *If you have a supported video card, Vegas Pro can use your GPU to improve AVC rendering performance. You can turn GPU-accelerated encoding on or off by adjusting the* **Encode mode** *setting on the Video tab of the Custom Settings dialog for a Sony AVC rendering template. Choose* **Automatic** *or* **Render using GPU if available** *to render using the GPU, or choose* **Render using CPU only** *to turn off GPU-accelerated encoding.*

**NVIDIA GPUs**

*GPU-accelerated AVC rendering requires a CUDA-enabled GPU and NVIDIA drive 185.xx or later. We recommend using a GeForce GT 2xx Series or newer GPU.*

*For more information about CUDA-enabled GPUs, please see http://www.nvidia.com/object/cuda_learn_products.html.*

**ATI GPUs**

*GPU-accelerated AVC rendering requires an OpenCL-enabled GPU and Catalyst driver 11.2 or later. We recommend using an ATI Radeon HD 57xx or newer GPU.*

*For more information about OpenCL-enabled GPUs, please see http://www.amd.com/us/products/desktop/graphics/Pages/desktop-graphics.aspx.*

If you want to render to AVCHD format and export the rendered file to an AVCHD camera, please use the following steps:

1. Verify that your Vegas Pro project is set to 5.1 surround mode.
2. In the Render As dialog, choose **Sony AVC/MVC** in the Output Format box.
3. Use one of the following templates:
   - AVCHD 1440x1080 NTSC 5.1 Surround
   - AVCHD 1920x1080 NTSC 5.1 Surround
   - AVCHD 1440x1080 PAL 5.1 Surround
   - AVCHD 1920x1080 PAL 5.1 Surround
4. If you choose to use the Custom Template dialog to customize your rendering template, leave all settings at their default values except for the **Bit rate** control. The default **Bit rate** setting should work for most applications.

5. To save the rendered file to your camera, you'll need to use the software that was supplied with your camera.

## Adding media to the timeline

Media files can be added to your project from the Explorer or Project Media windows by double-clicking them or by dragging them. Either method places the media file in an event in its entirety in the timeline.

### Dragging a media file to the timeline

You can create a new track by dragging a media file to a blank area on the timeline and dropping it in place. Tracks can contain multiple events, so you can place different events next to each other on a track.

**Note:** *Video and audio events cannot be placed on the same track.*

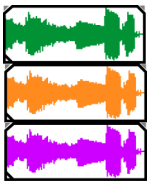
1. Locate a media file in the Explorer or Project Media window.
2. Drag the media file to the timeline.

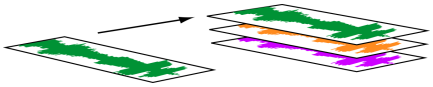
   An event for the media file appears where you released the mouse.

### Dragging multiple media files to the timeline

1. Select multiple media files in the Explorer or Project Media window. Select a range of adjacent media files by pressing Shift and clicking the first and last files in the range or select files that are not adjacent by pressing Ctrl and clicking individual files.
2. Right-click and drag the files to the timeline.
3. When you release the mouse, a shortcut menu appears. Select a placement option from the menu.
   - **Add Across Time**

   - **Add Across Tracks**

     
   - **Add As Takes**

     You will see one event on the track. The other events are listed as takes "beneath" the topmost event.

     *For more information, see Working with takes on page 105.*
   - **Video Only** and **Audio Only** allow you to isolate either the video or audio, and add that stream from a multimedia file either across tracks, across time, or as takes.

**Tip:** *A left-click drag-and-drop automatically inserts files across time. However, you can cycle through placement modes by right-clicking (without releasing the left mouse button) while performing the drag-and-drop operation.*

### Double-clicking a media file

This method places the event at the cursor's position in the selected track. If the selected track is a video track, and you double-click an audio event (or vice versa), a new track is created for the event. Once an event is placed, you can move it from one track to another or change its position on the timeline.

### Inserting a video file with associated audio

Media files with video frequently include associated audio. When you insert a media file into the timeline, the associated audio is automatically inserted into a separate audio track below the video track. The two associated events are grouped together and behave as a single unit when moved or otherwise edited. You can ungroup the events to move them independently.

*For more information, see Clearing a group on page 189.*

Two events that contain the video (top) and audio (bottom) streams from a single multimedia video file. Each event is inserted on a separate track.

### Inserting layered PSD files

You can add layered PSD files to the Vegas Pro timeline, so each layer of the file is created as an event on its own track. These events are just like other events in Vegas Pro software. For example, you could use track motion to move layers individually, use parent tracks to group and move layers together, use track effects to animate just one layer of the graphic, or you could replace a layer with a video.

**Notes:**

- *Photoshop layer styles and layer masks are not supported. In Photoshop, add an empty layer above these layers, make only those layers visible, and choose Merge Visible. The new layer will be visible when added to the Vegas Pro timeline.*
- *Photoshop layer groups and adjustment layers are not supported.*
- *Photoshop layer blending modes, opacity, and names are not transferred to Vegas Pro compositing modes, track opacity, and track names.*

1. Select a layered PSD file in the Explorer or Project Media window.
2. Right-click and drag the file to the timeline.
3. When you release the mouse button, a shortcut menu is displayed. Choose **Add Across Tracks** to import the PSD layers across tracks in the timeline.

The PSD layers, including the composite layer, are now available as streams. You can change an event's stream by right-clicking an event, choosing **Stream** from the shortcut menu, and then choosing the stream you want to use for the event.

**Tip:** *You can also add layered PSD files to the timeline from the Trimmer. Right-click the media file and make sure* **Use All Streams and Channels** *is selected. Right-click and drag a time selection to the timeline. When you release the mouse button, choose* **Add Across Tracks** *from the submenu.*

### Automatically crossfading inserted events

When inserting multiple events across time, the events (both video and audio) can be set to automatically crossfade. Two options must be enabled in order to create crossfades automatically when adding multiple events. First, verify that a check mark appears next to **Automatic Crossfades** in the **Options** menu. Second, from the **Options** menu, choose **Preferences**, and on the **Editing** tab, select **Automatically overlap multiple selected media when added**. *For more information, see Using automatic crossfades on page 90.*

## Project references in rendered media files

When your project uses media that was rendered with an embedded project path reference, you can easily open the source project in the associated application if you need to edit the media later. Recent versions of ACID, Sound Forge, and Vegas Pro software allow you to save the project path reference when you render files.

For example, imagine that you have an audio file on the Vegas Pro timeline that was rendered from an ACID project. In previewing your Vegas Pro project, you discover that you'd accidentally rendered your ACID project with a critical track muted. You could simply right-click the event on the Vegas Pro timeline and choose **Edit Source Project** from the shortcut menu to reopen your ACID project, unmute the track, and then rerender it.

The project information in the rendered file is a reference to a project file only. If you modify the project file after rendering, the project data will no longer match the rendered file. To edit a project using a path reference, the project file and all media must be available on your computer.

**Tip:** *For more information on saving project path references in rendered files, see* *Rendering a project on page 363*.

#### Editing a referenced project

1. Perform one of the following actions:
   - Right-click a media file in the Explorer window.
   - Right-click a media file in the Project Media window.
   - Right-click an event on the timeline.
2. From the shortcut menu, choose **Edit Source Project**. An ACID, Vegas Pro, or Sound Forge window will open with the source project.

   To edit a source project using a computer other than the computer where the project was created, the editing computer must meet the following requirements:
   - The software that was used to create the project must be installed and the project file extension (.acd, .acd-zip, .veg, or .frg) must be registered on the editing computer.
   - The editing computer must have the same version (or later) of the software that was used to create the project.
   - The project file must exist on the editing computer using the same file path as on the computer where the project was created.
   - The project's source media must exist on the editing computer. If the media files do not use the same file path as on the computer where the project was created, you will be prompted to choose a new folder or replacement files.
3. Edit the project as necessary.
4. Render the edited project using the same name as the original media file and close the editing application.

   If you're editing an existing track, your project will automatically be updated to use the latest rendered media file.

## Capturing video

You can use the Video Capture application installed with Vegas Pro software to capture video clips from your DV or HDV video camera or via your SDI card and add them to the Project Media window. You can also specify a different third-party capture application for video capture.

**Tip:** *Capturing video can be demanding on your computer's resources. To avoid potential problems, we offer the following suggestions:*

- *Defragment your hard drive. Click the* **Start** *button in the task bar and choose* **Programs**. *From the* **Programs** *submenu, choose* **Accessories**, *followed by* **System Tools** *and then* **Disk Defragmenter**.
- *Don't use other software applications or screen savers while capturing video.*

**Notes:**

- *If you are using a DVD-based video camera, you can use the Import DVD Camcorder Disc dialog to import your video into your Vegas Pro project. For more information, see* *Importing video from a DVD camcorder on page 49*.
- *If you are using an XDCAM camera, you can use the XDCAM Explorer window to import XDCAM clips from a camera or deck. For more information, see* *Working with XDCAM Video on page 133*.

1. From the **File** menu, choose **Capture Video** or click the **Capture Video** button ( ) in the Project Media window. The Capture Video window appears.
2. Choose the option you want to use for capturing video:
   - Select the **DV** radio button if you want to capture DV or Video for Windows clips using the video capture application specified on the **Video** tab of the Preferences window.
   - Select the **HDV or SDI** radio button if you want to capture SDI/HDV clips using the internal Vegas Pro video capture application.

**Tip:** *If you always capture from the same device, select the* **Always use the selected method** *check box, and you won't be prompted to choose a capture method again. You can change the method later using the* **Video** *tab of the Preferences window.*

3. Click **OK**. The specified video capture application starts.
4. Capture your video.
   - *For more information on capturing DV clips with the Video Capture application, see the Vegas Pro online help.*
   - *For more information on capturing HDV clips, see* *Capturing HDV clips on page 279*.
   - *For more information on capturing clips from a tape deck via an SDI (Serial Digital Interface) card, see* *Capturing from an SDI card on page 55*.

   After you have captured your video, Video Capture adds the files to the Project Media window. If any captured clips go offline, you can recapture the clips using your video capture application. Right-click an offline file in the Project Media window and choose **Recapture** from the shortcut menu.

### Capturing from an SDI card

If you have a supported SDI card, you can use the card to capture video and print to tape from the timeline.

The following procedure will guide you through the process of capturing clips from an SDI card.

Before you begin capturing video, use the Capture Preferences dialog to configure your SDI card. *For more information, see Capture Preferences on page 57.*

**Important:**

- *Blackmagic Design DeckLink HD Extreme/Intensity Pro/HD Extreme 3D and AJA Io Express, KONA 3X, LH, LHe, LHi, LS, and LSe cards are supported. Please note that AJA XENA cards are now branded as KONA cards. For more information, please see the AJA Web site at http://www.aja.com/products/kona/transition.php.*
- *HDMI capture is supported on the Blackmagic Design DeckLink HD Extreme/Intensity Pro/HD Extreme 3D, AJA Io Express, and AJA KONA LHi cards.*
- *Vegas Pro does not support analog video inputs for SDI cards. However, Vegas Pro does support component video output for external preview.*
- *For the latest information about supported hardware, please see our Web site at http://www.sonycreativesoftware.com/vegaspro/io#sdi.*

#### Capturing a single clip or entire tape

**Tip:** *Connect your deck and power it on before starting Vegas Pro software.*

1. Use the transport controls below the Video Preview window to cue your video.
2. If you want to encode your video during capture, you can choose a setting from the **Encoding** drop-down list. Depending on your input format, the available encoding formats are as follows:

| Input | Encoding |
|---|---|
| HDV | **MPEG-2 Transport Stream** |
| SD SDI | **8-bit YUV AVI** |
| | **IMX MXF** |
| HD SDI | **8-bit YUV AVI** |
| | **HD 422 MXF** |
| 10-bit SDI | **10-bit YUV AVI** |

3. The **Capture folder** box displays the path to the folder where your video will be saved. You can click the **Browse** button to choose a different folder.
4. Click the **Start Capture** button ( ) to start capturing.
5. Click the **Stop** button ( ) or press Esc to end the capture procedure.

   Your clip is saved to the folder specified in the **Capture folder** box and is also added to the Project Media list, from which you can add it to the timeline.

   If you've configured your capture device to capture multiple channels of audio, the audio will be added across tracks when you add the clip to the timeline. You can open the clips in the Trimmer window to choose which channels you want to use.

### Logging multiple clips and performing a batch capture

**Tip:** *Connect your deck and power it on before starting Vegas Pro software.*

1. Use the transport controls below the Video Preview window to cue your tape.
2. Click the Clip Edit tab on the right side of Video Capture window and log your clips:
   a. In the **Clip Name** box, type the file name you want to use to save the clip.
   b. In the **Tape Name** box, type the name of the tape that contains the clip.
   c. In the **Timecode In** box, type the timecode value that corresponds to the beginning of the clip, or click the **Mark Timecode In** button ( ) to use the current frame if you're cueing with the controls on your deck.
   d. In the **Timecode Out** box, type the timecode value that corresponds to the end of the clip, or click the **Mark Timecode Out** button ( ) to use the current frame.

   **Tip:** *Select the* **Calculate Length** *button ( ) next to the* **Timecode in**, **Timecode out**, *or* **Length** *box to prevent editing of that setting and calculate its value based on the other two timecode values.*

   e. Click the **Add Clip to Log** button ( ) to add the clip to the Clip Log.
   f. Repeat steps 2a through 2e for each clip you want to capture.
3. If you want to encode your video during capture, you can choose a setting from the **Encoding** drop-down list. Depending on your input format, the available encoding formats are as follows:

| Input | Encoding |
|---|---|
| HDV | **MPEG-2 Transport Stream** |
| SD SDI | **8-bit YUV AVI** |
| | **IMX MXF** |
| HD SDI | **8-bit YUV AVI** |
| | **HD 422 MXF** |
| 10-bit SDI | **10-bit YUV AVI** |

4. The **Capture folder** box displays the path to the folder where your video will be saved. You can click the **Browse** button to choose a different folder.
5. Click the **Clip Log** tab on the right side of Video Capture window.
6. Click the **Capture Clips** button ( ) and choose a command from the drop-down list to start capturing clips to the folder specified on the Disk Management tab of the Capture Preferences dialog.

| Command | Description |
|---|---|
| **Capture all clips** | Captures all clips in the log. If a clip has already been captured, it will be recaptured. |
| **Capture selected clips** | Captures all selected clips in the log. Hold Shift or Ctrl to select multiple clips. |
| **Capture offline clips** | Captures all clips with a status of Offline in the log. |

The captured clips are also added to the Project Media list, and you can add them to the timeline.

If you've configured your capture device to capture multiple channels of audio, the audio will be added across tracks when you add the clip to the timeline. You can open the clips in the Trimmer window to choose which channels you want to use.

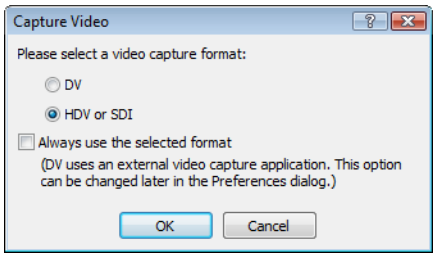
**Tips:**

- *Click the* **Save Clip Log** *button ( ) to save the current clip log as an XML file if you want to save your clip log for capture or recapture at a later time.*
- *Click the* **Open Clip Log** *button ( ) and browse to a saved clip log to load a previously saved clip log.*

## Capture Preferences

You can use the Capture Preferences window to set options for capturing video from an SDI or HDV device.

1. From the **File** menu, choose **Capture Video**, or click the **Capture Video** button ( ) in the Project Media window. The Capture Video dialog is displayed.


Capture Video
Please select a video capture format:
DV
HDV or SDI
Always use the selected format
(DV uses an external video capture application. This option can be changed later in the Preferences dialog.)
OK
Cancel

2. Select the **HDV or SDI** radio button and click OK. The Capture window is displayed.
3. Click the **Capture Preferences** button ( ) in the Capture window to open the Capture Preferences dialog.

### General tab

| Item | Description |
|---|---|
| **Stop device on loss of focus** | Stops the selected capture device when focus is switched away from the capture application. |
| **Show video when device is stopped** | Displays the current frame when the selected capture device is stopped. |
| **Show video when device is fast-forwarding and rewinding** | Displays video in the capture preview window when you fast-forward or rewind the device. |
| **Add new clips to project media** | Select this check box if you want to add captured clips to the Project Media window when capturing is complete. |
| **Simulate device pixel aspect ratio** | Displays square pixels in the Video Preview window even if the **Pixel aspect ratio** setting in the Project Properties dialog is using nonsquare pixels. |
| **Fail on dropped frames** | Select this check box if you want to stop capturing if a dropped frame is detected. |
| **When capture fails, stop batch capture** | Select this check box if you want to stop an SDI batch capture if a dropped frame is detected. |
| **Enable HDV scene detection** | Select this check box if you want to create multiple files if scene changes are detected. When the check box is cleared, HDV clips will be captured to a single file. |
| **Preroll** | Type a value in the box to specify the number of seconds of preroll Video Capture should use for SDI batch capture.<br><br>When you click the **Capture Clips** button ( ) on the **Clip Log** tab, Video Capture will seek to a point prior to your **Timecode in** setting determined by the number of seconds you enter in the **Preroll** box. Video Capture will begin playback at the preroll location, and switch to capture when it reaches the timecode you specified in the **Timecode in** box. |
| **Maximum RAM buffer size** | Drag the slider to allocate a portion of your system memory as a buffer. During capture, this buffer is used to prevent dropped frames if your hard disk is unable to write a frame. |
| **MPEG video quality** | When capturing to compressed formats, you can drag the slider to adjust performance. When you drag the slider to the left, you can increase performance by decreasing video quality. When you drag the slider to the right, higher-quality video is captured, and more processing power is required.<br><br>**Note:** *Quality settings affect various types of material differently. With some experimentation, you may find that certain types of scenes can be captured at lower quality settings with little or no apparent loss of quality. Other material may need the highest possible setting to achieve the desired quality level.* |

**Device tab (for IEEE 1394 HDV devices)**

| Item | Description |
|---|---|
| **Device type** | Choose **IEEE 1394/MPEG2-TS Device**. |
| **Device** | Choose your HDV camera. |
| **Video** | Choose a setting from the drop-down list to specify the desired video format. |
| **Details** | Displays information regarding the capture device specified in the **Device** drop-down list. |

**Device tab (for AJA Io Express, KONA 3X, LH, LHe, LHi, LS, or LSe SDI cards)**

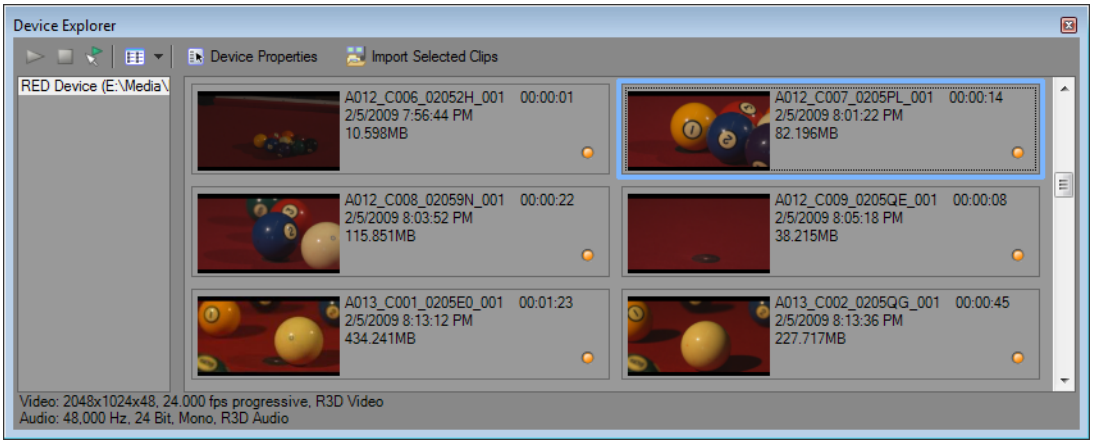
| Item | Description |
|---|---|
| **Device type** | Choose **AJA Video Device**. |
| **Device** | Choose your device. |
| **Input** | Choose SDI or HDMI. |
| **Video format** | Choose a setting from the drop-down list to specify the desired video format. |
| **Audio format** | Choose a setting from the drop-down list to specify the desired number of channels for capturing SDI-embedded audio.<br><br>**Important:** *Multichannel audio capture is available only if supported by your camera or deck.* |
| **Use progressive segmented frame (psf) video formats** | Select this check box if your project properties are set to a progressive-scan format and you want to capture from a device that stores and transfers progressive-scan frames by dividing fields. |
| **Use 10-bit encoding** | Select this check box if you want to capture 10-bit source material for increased color resolution. Source material with gradients in the background can benefit from 10-bit encoding.<br><br>When you use 10-bit video in your project, choose **32-bit floating point (video levels)** from the **Pixel format** setting on the Video tab of the Project Properties tab.<br><br>When the check box is not selected, the captured video will use 8-bit encoding. |
| **Timecode source** | Choose a setting from the drop-down list to specify the desired timecode source.<br><br>• **9-Pin Remote** Estimates timecode using the 9-pin RS422 cable from the deck. This format is more prone to errors and requires more preroll than RP-188.<br>• **RP-188** Uses SMPTE RP 188 timecode embedded in the video.<br><br>**Important:** *RP-188 is recommended when capturing HD video.* |
| **Timecode offset (frames)** | If video capture is not frame accurate, drag the slider to adjust timecode. |

**Device tab (for Blackmagic Design DeckLink HD Extreme, Intensity Pro, or HD Extreme 3D SDI cards)**

| Item | Description |
|---|---|
| **Device type** | Choose **Blackmagic Design DeckLink**. |
| **Device** | Choose your device. |
| **Video** | Choose a setting from the drop-down list to specify the desired video format. |
| **Audio** | Choose a setting from the drop-down list to specify the desired number of channels for capturing SDI-embedded audio.<br><br>**Important:** *Multichannel audio capture is available only if supported by your camera or deck.* |
| **Use 10-bit encoding** | Select this check box if you want to capture 10-bit source material for increased color resolution. Source material with gradients in the background can benefit from 10-bit encoding.<br><br>When you use 10-bit video in your project, choose **32-bit floating point (video levels)** from the **Pixel format** setting on the **Video** tab of the Project Properties window.<br><br>When the check box is not selected, the captured video will use 8-bit encoding. |
| **Timecode source** | Choose a setting from the drop-down list to specify the desired timecode source.<br><br>• **9-Pin Remote** Estimates timecode using the 9-pin RS422 cable from the deck. This format is more prone to errors than VITC or HANC.<br><br>• **VITC** Uses SMPTE 12M timecode embedded in the video.<br><br>• **HANC** Uses SMPTE RP 188 timecode embedded in the video. |
| **Timecode offset (frames)** | If video capture is not frame accurate, type a value in the box or use the spin control to adjust timecode. |

## Using the Device Explorer

The Device Explorer allows you to browse and import clips from AVCHD, XDCAM EX, NXCAM, and RED ONE and EPIC devices; CompactFlash-based memory recording units such as the HVR-MRC1; and hard-disk-based recording units such as the HVR-DR60.




1. From the **View** menu, choose **Device Explorer** to display the Device Explorer window.
2. Connect your camera to a USB 2.0 port on your computer. The camera is displayed on the left side of the Device Explorer window.

**Tips:**

- *If you want to use clips from a folder on your computer, right-click the left pane of the Device Explorer window and choose* **Browse** *from the shortcut menu.*
- *In order for some devices to appear in the Device Explorer window, you may need to change the device's USB Connect setting from* **Automatic** *or* **MTP** *to* **Mass Storage**.

### Previewing clips

Select your camera on the left side of the Device Explorer window. The camera's clips are displayed on the right side of the window, and clips that have not yet been imported are indicated with a new clip icon ( ).

If the **Auto Preview** button ( ) is selected, you can click a clip in the Device Explorer to audition it in the Video Preview window. You can stop the preview by clicking the **Stop Preview** button ( ), or you can turn off the preview feature by deselecting the **Auto Preview** button.

**Note:** *Video is previewed in the Trimmer window. If you want to preview video in the Video Preview window, right-click the Trimmer window and clear the* **Show Video Monitor** *command.*

When the **Auto Preview** button is not selected, click the **Start Preview** button ( ) to start preview.

### Choosing the folder where you want to import clips

1. Select your camera on the left side of the Device Explorer window and click the **Device Properties** button ( ).

   The Device Properties dialog is displayed, and the **Capture Folder** box shows the path to the folder where imported clips will be saved.
2. Click the **Browse** button to display the Capture Folders dialog. This dialog displays the available folders for saving your imported video:
   - Select a folder's check box to save your imported video in that folder.
   - Click the **Add Folder** button ( ) and browse to a folder to add a new folder.
   - Select a folder in the list and click the **Delete** button ( ) to remove it from the list.

### Importing clips

1. Select your camera on the left side of the Device Explorer window. The camera's clips are displayed on the right side of the window, and clips that have not yet been imported are indicated with a new clip icon ( ).
2. Click the **Import** button ( ) to import clips to the Project Media window:
   - If clips are selected in the Device Explorer window, only the selected clips are imported (you can hold Ctrl while clicking to select multiple clips).
   - If no clips are selected in the Device Explorer window, all new clips are imported.

> **Tip:** *Right-click a clip in the Device Explorer window and choose* **Open in Trimmer** *or* **Import and Add to Project** *to choose how you want to import clips.*

3. You can then use the Project Media window to organize your clips and add the imported video to your project just like any other media file.

   *For more information, see* *Using the Project Media window on page 42*.

   *For more information about AVCHD and XDCAM EX workflows, see* *Working with AVCHD video on page 49 and XDCAM EX workflow on page 133*.

   *For more information about RED ONE and EPIC workflows, see* *Working with RED ONE and EPIC camera files on page 281*.

> **Note:** *5.1-channel audio will be downmixed to stereo when importing into a stereo project. When importing into a 5.1 surround project, audio will be added to separate tracks for the center, front, rear, and LFE channels.*

> **Tip:** *You can also drag a clip from the Device Explorer directly to the Project Media window, Trimmer, or timeline. Vegas Pro begins importing the clip when you release the mouse, and an event is created on the timeline when importing is finished.*

## Working with events

Events are the most basic objects in a project. An event is something that happens in time, has a specific duration, and can be video or audio.

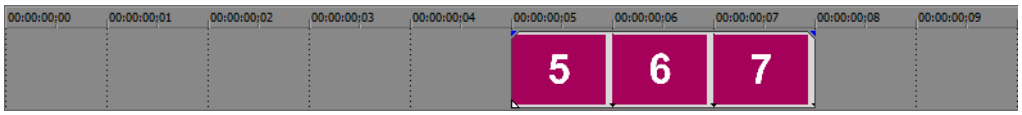
### Understanding files and events

The objects you work with are referred to as media files and events.

- **Files** are objects that are stored on your hard disk. In Vegas Pro software, you will work with media files, such as music and video files. These files are neither operated on nor changed. You can access files from the Vegas Pro Explorer window.
- **Events** are periods of time on the timeline that act as windows into media files, either whole or in part. When you drag a media file onto the timeline, you automatically create an event that contains that file's contents. An event can contain video, audio, still images, or generated media. The event window can contain only a small portion of a much larger media file. A single media file can be used repeatedly to create any number of different events, since each event can be trimmed independently.

The original media file.

An event trimmed from the original media file.




The event as it appears in the Vegas Pro timeline.

**Audio events** are created from audio files on your computer (for example, .wav and .mp3) or can be a part of a video file (for example, .avi). You can change many characteristics of an audio event, such as speed, volume, and equalization. Audio events can be mixed with other audio events.

**Video events** are created from video files captured to your computer (typically AVI, MOV, QT) or images (BMP, JPEG, PNG, or TGA). You can change many characteristics of a video event, such as speed, color, and size. Video events can overlay other video events and are visual elements that appear on top of a background video, image, or color.

## Moving events along the timeline

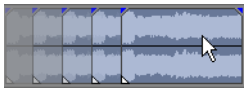
You can move events along the timeline individually or as a group. Events can overlap each other or be placed on top of each other. You can crossfade overlapping events automatically or with envelopes.

### Moving an event

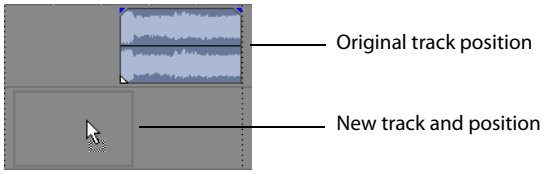
You can move an event along the timeline within a track or move it to a different track.

1. Drag the event along the timeline.

   If you move the event along the original track's timeline, the event's appearance (color) remains the same.



   However, you can move the event to a different track. When you do, the event appears as a simple outline and you will see its original track and position on the timeline. Once you release the mouse, the event assumes the new timeline position and track color.




2. Release the mouse to place the event.

### Moving multiple events

You can move multiple events along the timeline within a track or move them to a different track. Selected events do not need to be within the same track. Use the Ctrl key, the Shift key, or the **Selection Edit Tool** to select multiple events and drag them. To select all events on the track after a given event, right-click the event and choose **Select Events to End**. *For more information, see Selecting multiple events on page 72.*

### Moving events by small increments

To move an event more precisely, click the event and press 4 or 6 on the numeric keypad to nudge it by small increments. The amount of movement caused by each nudge is determined by how far the timeline is zoomed in or out. You can also click the event and press 1 or 3 on the numeric keypad to nudge the event by frames.

### Moving grouped events

Groups allow you to move multiple events within their tracks as a single unit. While you can create your own groups as needed, groups are automatically created for you when video files with associated audio (for example, .avi) are added to a project. When you add these video files, the audio portion of the video file is inserted into the timeline as a separate audio event. The video and audio events are grouped and can be moved as a single unit within their respective tracks.

To move grouped events, drag any event in the group to a new position. *For more information, see Grouping events on page 188.*

## Working with tracks

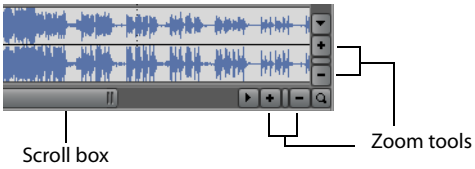
A project consists of multiple audio and video tracks. The timeline is the view in which all events appear. The track list provides information about the track and contains controls that affect all events in the track.

### Using the timeline

Numerous options are provided for viewing and navigating in the timeline.

### Scrolling and zooming

There are several ways to scroll and zoom in the timeline.




- Click the scroll bar arrows or drag the scroll bars to move up and down the tracks or to move forward and back along the timeline.
- Click the **Zoom** buttons ( ) to reveal more or less of the timeline.
- Drag the edge of the scroll box, found on the scroll bar, to zoom.
- Press the Up Arrow and Down Arrow keys to zoom in and out along the timeline.
- Click the **Zoom Edit Tool** ( ) button or, from the **Edit** menu, choose **Editing Tool** and then choose **Zoom**. In this mode, drag on the timeline to draw a rectangle that defines the zoom region.

**Tip:** *You can also access the Zoom Edit Tool from the lower-right corner of the timeline ( ).*

Mouse wheel control is also supported. The default behavior of the wheel is to zoom horizontally.

- Shift+wheel scrolls horizontally (through time).
- Ctrl+wheel scrolls vertically.
- Ctrl+Shift+wheel moves the cursor in small increments.
- Ctrl+Shift+Alt+wheel moves the cursor in one-frame increments.
- Clicking the mouse wheel turns auto-panning on and off.

Zooming directly controls the accuracy of your editing. Each video event has thumbnail representations of the frames within the event. Depending on how far you have zoomed in on a video event, a thumbnail can represent the entire event or a single frame in the event.

**Tip:** *You can choose to display frame numbers, time, or timecode on video event thumbnails. For more information, see Displaying frame numbers on page 402.*

### Changing track height

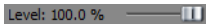
You can change the height of individual tracks by dragging their borders in the track list. In the example below, the main video track is fairly large to show the details of the scene while the two tracks above it, which are overlays, have been resized to a shorter height. *For more information, see Changing track height on page 150.*

## Using the track list

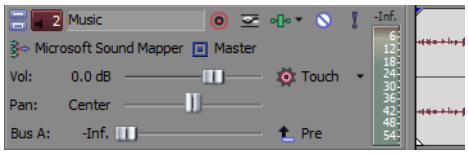
This section describes the different controls in the track header of each track. Some controls are specific to either video or audio tracks.

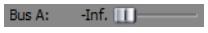
### Video track header

| Button or Control | Name | Description |
|---|---|---|
| | Track number and color | Track numbers and colors help organize a multitrack project. *For more information, see Managing tracks on page 147.* |
| | Minimize track height | Minimizes track height. *For more information, see Changing track height on page 150.* |
| | Maximize track height | Maximizes track height. *For more information, see Changing track height on page 150.* |
| Video | Track name (scribble strip) | Allows you name a track. To name a track, double-click the scribble strip and type the track's name. *For more information, see Naming or renaming a track on page 147.* |
| | Bypass motion blur | Bypasses motion blur envelope for a track. *For more information, see Using video bus tracks on page 160.* |
| | Track motion | Track motion is used to move a video track across a background. Picture-in-picture effects and scrolling title sequences are two simple cases where this tool is important. *For more information, see Adding track motion on page 339.* |
| | Track FX | Adds track effects plug-ins. *For more information, see Applying video effects on page 301.* |
| | Automation Settings | Toggles automation on or off. When this button is selected, trim controls are displayed for composite level automation and fade-to-color automation. *For more information, see Using Automation on page 163.* |
| | Mute | Temporarily suspends playback of the track so that you can focus on other tracks. *For more information, see Muting a track on page 157.* |
| | Solo | Isolates a track for playback by muting the other tracks. *For more information, see Soloing a track on page 158.* |

| Button or Control | Name | Description |
|---|---|---|
|  | Composite level slider | Determines the opacity/transparency of the video track. Drag the slider to control the transparency or blending of the track. Left is 100% transparent and right is 100% opaque. You can also double-click the label to enter a specific numeric percentage. |
| | Compositing mode | Determines how the transparency in a video track is generated. *For more information, see Selecting compositing modes on page 308.* |
| | Make compositing child | Creates a parent/child compositing relationship with the track above. Used when creating masks. *For more information, see Understanding the parent/child track relationship on page 306.* |
| | Expand track keyframes | Displays track keyframes on the timeline. *For more information, see Working with keyframes in the timeline on page 334.* |

### Audio track header




| Button or Control | Name | Description |
|---|---|---|
| | Track number and color | Track numbers and colors help organize a multitrack project. *For more information, see Managing tracks on page 147.* |
| | Minimize track height | Minimizes track height. *For more information, see Changing track height on page 150.* |
| | Maximize track height | Maximizes track height. *For more information, see Changing track height on page 150.* |
| | Track name (scribble strip) | Allows you name a track. To name a track, double-click the scribble strip and type the track's name. *For more information, see Naming or renaming a track on page 147.* |
| | Arm for Record | Prepares a track for recording. You can record directly into audio tracks. A track is ready when you see the recording meter appear on it. *For more information, see Preparing to record on page 238.* |
| | Invert Track Phase | Inverts the audio track at its baseline, in effect reversing its polarity. *For more information, see Phase inverting a track (audio only) on page 156.* |
| | Track FX | Adds track effects plug-ins. *For more information, see Using audio effects on page 227.* |
| | Mute | Temporarily mutes playback of the track so that you can focus on other tracks. *For more information, see Muting a track on page 157.* |
| | Solo | Isolates a track for playback by muting the other tracks. *For more information, see Soloing a track on page 158.* |
| | Record Input | Toggles input monitoring and allows you to choose a recording device. *For more information, see Preparing to record on page 238.* |
| | Bus Assignment | Assigns an audio track to a specific output bus. This option is available for projects being mixed for multiple stereo busses. *For more information, see Assigning audio tracks to busses on page 155.* |
| | Volume fader | Controls the audio track volume relative to the other tracks. Drag the fader left or right to adjust the volume. *For more information, see Using the volume fader (audio only) on page 151.* |
| | Automation Settings | Toggles automation on or off. When this button is selected, trim controls are displayed for track volume, panning, assignable effects send levels, and bus send levels. *For more information, see Using Automation on page 163.* |
| | Pan slider | Controls the overall panning of the track. Drag the slider left or right to adjust panning. *For more information, see Using the pan slider (audio only) on page 151.* |
|  | Multipurpose slider | Controls several features, including bus send levels, and assignable effects send levels. Select what the slider controls by clicking the label. Each item's slider position is independent from the others. *For more information, see Using the multipurpose slider (audio only) on page 154.* |
| | Pre/Post Volume Send | Click to toggle pre- and post-volume send mode for bus sends and assignable effects sends. *For more information, see Assigning audio tracks to assignable effects chains on page 154 and Assigning audio tracks to busses on page 155.* |

## Nesting projects

With Vegas Pro software, you can simplify and organize complex projects by adding multiple projects to the timeline of a single Vegas Pro project. Using project nesting, you can:

- Create a single element that can be used in multiple locations or projects. If you update the project, it is updated everywhere.
- Create a complex composited element that can be used as a single media event in multiple locations or projects.
- Create a transition across multiple events by placing the events in a nested project and applying the transition to the nested events project.
- Create a musical composition with its own tempo and bus structure that can be used in another project.
- Create an individual project for each scene in a video and place those projects in a master project. You can apply color correction to each project individually, and then apply color correction to the master project as well.
- Use master projects to deliver a single project in multiple formats without time- and disk-consuming intermediate renders: for example, you could add your 24p, 16:9 HD (high-definition) project to a master project to reformat the project as widescreen SD (standard definition) for DVD, letterboxed SD for VHS, 4:3 pan-and-scan SD, or 25p.

Use one of the following methods to nest an existing project in your current timeline:

- From the Windows® Explorer or the Explorer window, drag a Vegas Pro project file (.veg) to the timeline. The project is added to the timeline where you drop it.
- From the **File** menu, choose **Import** and then choose **Media** to browse to the .veg file you want to nest.

Using any of the methods above, the Vegas Pro project file is also added to the Project Media window. After a nested project is in the timeline, you can edit its events just as you would any other event in your project.

**Notes:**

- *The output from the nested project's master bus is used to create the audio event. If you nest a 5.1 surround project, the audio event will be a stereo downmix of the surround master bus.*
- *Audio events from nested projects cannot be edited in a sound editor.*
- *The audio from a nested project will require that a proxy file be built. To avoid building proxy files, delete audio from nested projects and use the master project to create your audio.*
- *Markers and regions in the nested project are displayed in the timeline as media markers in the event.*
- *Prerendered video from a project will be used when that project is nested in another project's timeline.*
- *You can edit a nested project by right-clicking the event in the timeline and choosing* **Edit Source Project** *from the shortcut menu. A new Vegas Pro window will open to allow you to edit the project.*

## Playing back and previewing

You can play back your project in two ways: directly from the timeline from within the software or by mixing the entire project to a preview file.

### Playing your project

The transport bar allows you to play back your entire project or portions of your project based on a time selection or the current cursor position. *For more information, see Transport bar controls on page 24.*

If your project includes video, make sure the Video Preview window is displayed for playback: from the **View** menu, choose **Video Preview** or press Alt+6.

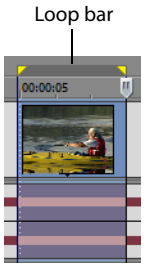
#### Playing an entire project

1. Click the **Play From Start** button ( ) to begin playback at the beginning of the project.
2. Click the **Stop** button ( ) to stop playback.

Most of the time, you will only want to preview a small portion of the project to perfect a section. You can do this by creating a time selection.

#### Playing a time selection

1. Place the mouse pointer above the ruler on the marker bar. The mouse pointer changes to include a left/right arrow cursor ( ).
2. Drag to select the time region. To increase or decrease the time selection, drag its start and end points. The time selection is highlighted and the loop bar appears above the ruler on the timeline.




3. Click the **Play** button ( ) to begin playback. Only the non-muted tracks and events within the time selection play back.
4. Click the **Loop Playback** button ( ) to continually play back the events within the time selection. Click the button again to toggle this feature off.
5. Click the **Stop** button ( ) to stop playback.

By looping the playback, you can repeatedly watch the same section of the project over and over as you make changes to filters and effects in real time. You can define selection areas automatically, depending on what you would like to preview.

*For more information, see Selecting a time range on page 73 and Cursor placement, loop region, and time selection commands on page 477.*

### Playback reference

The following table describes all the transport bar buttons and their keyboard equivalents. You can use these playback functions at any time while working in your project.

**Note:** *The use of many multimedia keyboards is also supported for controlling playback.*

| Button | Keyboard | Function |
|---|---|---|
| | Ctrl+R | Begin recording into record-enabled tracks |
| | Q | Turn on/off loop playback during time selection playback |
| | Shift+Space | Begin playback from the start of the project |
| | Space | Begin playback from cursor position |
| | Enter | Pause playback, cursor stops and holds at pause position |
| | Space or Esc | Stop playback, cursor stops and returns to prior cursor position |
| | Ctrl+Home | Place cursor at the beginning of project |
| | Ctrl+End | Place cursor at the end of the project |

**Tip:** *You can use the Spacebar key to stop or pause playback, depending on your preference. From the* **Options** *menu, choose* **Preferences***, and on the* **General** *tab, select* **Make spacebar and F12 Play/Pause instead of Play/Stop** *to change the setting.*

## Scrubbing

Scrubbing is a type of timeline playback that gives you precise control over the speed and direction of playback. Both linear and logarithmic scale scrubbing are allowed by selecting or clearing the **Use linear scrub range** check box on the **General** tab of the Preferences dialog. *For more information, see General tab on page 413.*

The use of multimedia controllers is supported for scrubbing.

*For more information about using the software with multimedia controllers, see Using Hardware Controllers on page 433.*

**Tip:** *Choose a setting from the* **JKL / shuttle speed** *drop-down list on the* **Editing** *tab of the Preferences dialog to control the scrub speed and range when using the keyboard or multimedia controllers. For more information, see Editing tab on page 427.*

Four methods of scrubbing are provided.

### Scrubbing with the playhead

The playhead ( ) above the timeline can be dragged back and forth to shuttle forward or backward from the cursor position to locate an edit point.

Drag playhead to scrub

**Tips:**

- *Set in and out points while dragging the playhead by pressing the I and O keys.*
- *The playhead is also available in the Trimmer window.*

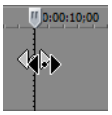
### Scrubbing with the scrub control slider

The scrub control slider can be dragged back and forth. The farther from the center that the slider is dragged, the faster the playback, both forward and in reverse. Below the slider is a small yellow marker that can be used to set the normal rate playback speed. This is the speed at which the project plays when you click the **Play** button on the transport bar.

### Scrubbing on the timeline

A project can be scrubbed by positioning the mouse pointer over the timeline cursor at a location that is not over any events and pressing Ctrl. The cursor changes to a speaker icon. Now, when you left-click, the cursor icon changes again to a pan/scrub icon. Drag the mouse left or right to scrub the timeline.

Press Ctrl over timeline cursor

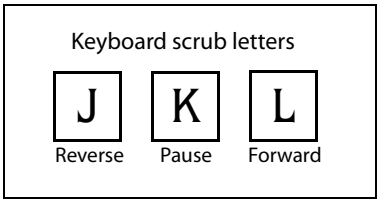



Left-click and drag to scrub

**Tip:** *You can also choose to enable timeline scrubbing when the mouse is positioned over events. From the* **Options** *menu, choose* **Preferences***, and select* **Allow Ctrl+drag cursor style scrub over events** *on the* **General** *tab.*

### Scrubbing with the keyboard

Three letters (JKL) are used as a keyboard scrub control.




**Note:** *Choose a setting from the* **JKL / shuttle speed** *drop-down list on the* **Editing** *tab of the Preferences dialog to control the scrub speed and range.*

Press J for reverse and L for forward playback. Press K to pause playback.

There are several ways to adjust playback speed:

- Adjust the **JKL / shuttle speed** selection on the **Editing** tab of the Preferences dialog.
- Hold K while pressing J or L to emulate a shuttle knob mode. Press K+J to turn the knob to the left or K+L to turn the knob to the right. Press K again or Space to return to normal mode.

## Prerendering video previews

Playing a project using the transport controls can instantly show how a project is progressing, but it does not actually render your project in its final form. The preview you see in the Video Preview window might be different from your final project in a number of ways: frame size, frame rate, and quality. In most cases, the Video Preview window is all you need for checking the timing of events in your project. Eventually, however, you might need to output a full-quality preview of a section of your project. To do this, from the **Tools** menu, choose **Selectively Prerender Video**.

*For more information, see Prerendering video on page 347.*

## Rendering a project

Rendering refers to the process of creating a new media file from a Vegas Pro project. The project file is not affected (overwritten, deleted, or altered) during the rendering process. You can return to the original project to make edits or adjustments and render it again.

More detailed instructions for rendering to a specific format appear later in this manual.

*For more information, see Saving, Rendering, and Printing Projects on page 361.*

## Sharing a project online

From the **File** menu, choose **Share Online** and then follow the on-screen instructions to choose a publishing provider and save your current project to the Web so you can share it with others.

Chapter 3

# Basic Editing Techniques

Vegas® Pro projects are multitrack compilations of events that occur over time. The events in your project are references (pointers) to source media files. Vegas Pro software is a nondestructive editor, so editing events in your project does not alter the source media files in any way.

## Getting around

When editing and playing back the project, the cursor identifies where you are along the project's timeline.

### Moving the cursor

Use the following keyboard commands to move the cursor in the timeline.

| Description | Keys |
|---|---|
| Go to beginning of project | Ctrl+Home or W |
| Go to end of project | Ctrl+End or E |
| Go to beginning of selection or view (if no selection) | Home |
| Go to end of selection or view (if no selection) | End |
| Move right by grid marks | Page Down |
| Move left by grid marks | Page Up |
| Go to | Ctrl+G |

| Description | Keys |
|---|---|
| Move left/right to marker(s) | Ctrl+Left/Right Arrow |
| Move to marker # | 0-9 keys (not numeric keypad) |
| Move left/right to event edit points including fade edges (see figure below) | Ctrl+Alt+Left/Right Arrow |
| Nudge cursor on timeline | Left or Right Arrow |
| Move left/right one frame | Alt+Left/Right Arrow |
| Move left/right one frame | Ctrl+Alt+Shift+Mouse wheel |
| Center in view | \ |

Event edit points

### Changing focus

Focus is used to describe which objects have the attention of a program. For example, when you click a file in the Project Media window, that window has focus. To instantly switch the program's focus to the timeline (track view), press Alt+0 or, from the **View** menu, choose **Focus to Timeline**.

In Vegas Pro software, it matters which track has focus when you perform a task. For example, when you double-click a media file in the Explorer, it is inserted into the track that has focus. You can click a track on its track number to make it the focus track. A blinking white line under the track number and shading in the track list indicates a track has focus.

## Making selections

You have the flexibility to select one or more events, a time range, or events *and* a time range. All selection options can apply to a single track or to multiple tracks.

To select an event, click it.

### Selecting multiple events

You can select multiple events in your project using several methods.

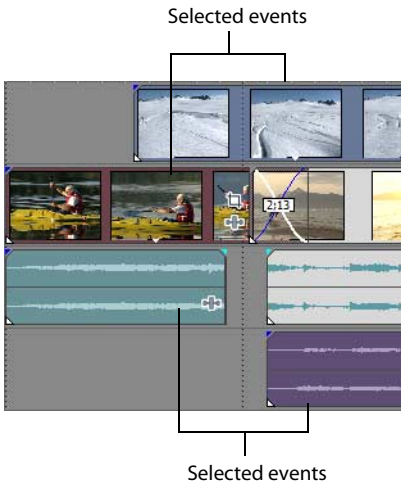
**Tips:**

- *Once you have selected multiple events, you can group them together. For more information, see Grouping events on page 188.*
- *You can select multiple video events, multiple audio events, or a combination of both video and audio events. However, you can only use commands and operations that apply to both types of events for selections composed of both audio and video events.*

#### Selecting nonadjacent events

1. Hold the Ctrl key.
2. Select the events by clicking them.

   To deselect an event, simply click it again to toggle the event selection on or off.




#### Selecting a range of events

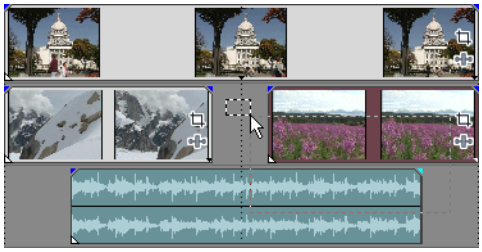
1. Hold the Shift key.
2. Click the first event that you want to select.
3. Click the last event that you want to select.

   All events between the first and last selected events are highlighted and selected.

**Tip:** *Click the right mouse button while holding the left mouse button switch from rectangular selection, time selection, and track selection.*

### Selecting a block of events

1. Click the **Selection Edit Tool** button ( ).
2. Position the cursor in a corner of the area that you want to select.
3. Click and hold the left mouse button.
4. Drag the cursor to the opposite corner of the area you want to select. A rectangle is drawn on the workspace. All events within this rectangle are selected.



Hold the left mouse button and right-click to toggle through the three types of selection boxes: free, vertical, or horizontal.

**Tip:** *You can include or exclude events from a selection area by pressing Ctrl and clicking an event. To deselect all events, click anywhere in the workspace outside of the selected events.*

### Selecting all events to the end of the track

1. Right-click an event. A shortcut menu appears.
2. From the shortcut menu, choose **Select Events to End**. All events on the track after the selected event are selected.

**Tip:** *To move large blocks of events, you can use* **Select Events to End** *with events selected on different tracks. Press Ctrl and click to select events on different tracks, and then right-click to access the shortcut menu.*

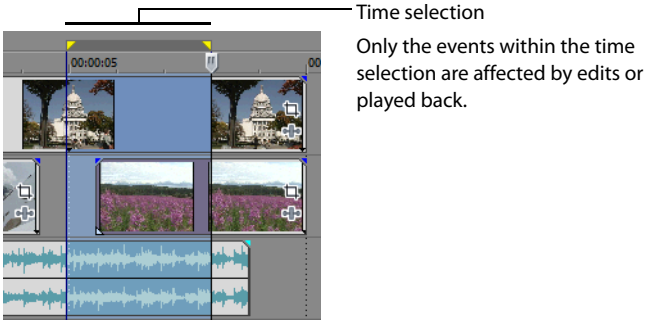
### Selecting all events that refer to a specific media file

Right-click a file in the Project Media window and choose **Select Timeline Events** from the shortcut menu. All events that use the selected media file in the active take are selected.

Hold Ctrl or Shift while choosing **Select Timeline Events** from the shortcut menu to add the events to the current selection.

## Selecting a time range

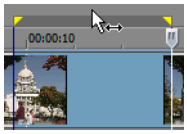
Time selections are indicated by a shaded box and a bar that appears on the top of the timeline. You can use the time selection bar for playing back a smaller portion of your project or to apply cross-track edits.




**Note:** *Unless an event is locked, a selected time range affects all events, or portions of events, that occur within the range.*

### Dragging to select a time range

1. Position the mouse pointer above the ruler (on the marker bar). The mouse pointer changes to a left/right arrow cursor ( ).
2. Drag to select a region. All events, or portions of events within the region are highlighted.
3. Drag the yellow handles on either end of the time selection to increase or decrease your time range selection.




**Tip:** *You can move the entire selection range by dragging the time selection bar.*

### Selecting a time range during playback

1. Click the **Play** ( ) or the **Play From Start** ( ) button to begin playback.
2. Press I where you want the time selection to begin.
3. Press O where you want the time selection to end.
4. Click the **Stop** button ( ) to stop playback.

### Using shortcuts for time selections

These shortcuts can speed up the process of making precise time selections.

| Description | Shortcut |
|---|---|
| Set time selection duration equal to an event's duration | Double-click the event |
| Extend selection to the end of the currently selected event edge | Ctrl+Shift+Alt+Right Arrow |
| Extend selection to the beginning of the currently selected event edge | Ctrl+Shift+Alt+Left Arrow |
| Drag a time selection on an event without selecting/deselecting the event | Ctrl+Shift+drag on the event |

**Tip:** *Press Backspace to recall the last five time selection areas.*

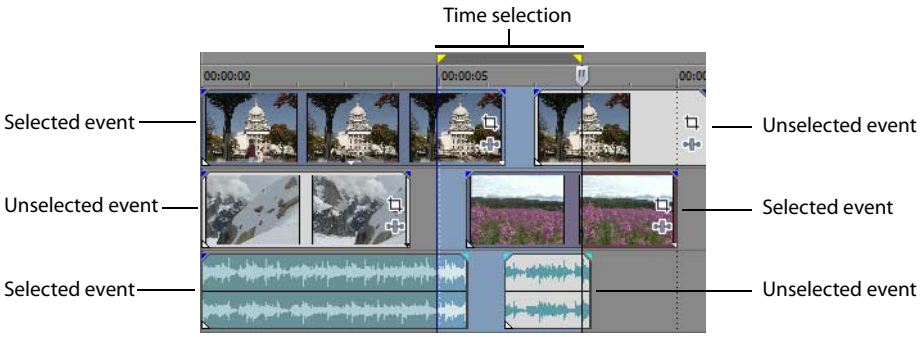
## Looping playback

If you want to play back the time range, click **Play** ( ) to play only the events within the time range. Click the **Loop Playback** button ( ) or press Q to toggle loop playback on and off. Vegas Pro software continually plays back the portion of the timeline within the time selection when loop playback is toggled on.

### Selecting events and a time range

Selecting a time range does not automatically select events. Excluding locked events, all items within the time range play back and are affected by **Edit** menu commands. However, you can select specific events to edit, and then select a time range.

1. Select the events you wish to edit. *For more information, see Selecting multiple events on page 72.*
2. Place the mouse pointer above the ruler (on the marker bar). The mouse pointer changes to a left/right arrow cursor ( ).
3. Drag to select the region. Notice that events that were not initially selected in step 1 remain unselected (not highlighted).

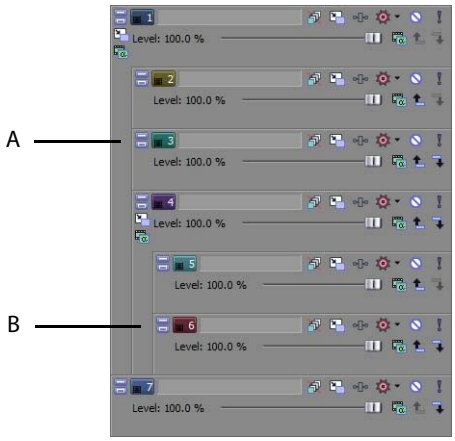



### Selecting tracks

Click a track header to select it. Hold Ctrl or Shift to select multiple tracks.

### Selecting groups of composited tracks

Click the vertical bar below a parent track to select a group of composited tracks. For example, clicking the area marked A in the following track list selects tracks 1 through 6. Clicking the area marked B selects tracks 4 through 6.



# Editing events

## Copying events

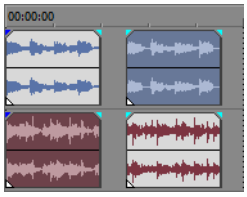
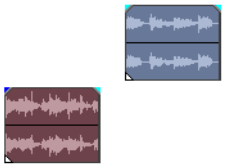
You can copy events, or portions of events, to the clipboard and paste them into your project. You can copy a single event or multiple events. Copying preserves the original event information, edits, and other modifications.

**Tip:** *When the* **Cut, copy, and delete grouped events** *check box on the* **Editing** *tab of the Preferences dialog is selected, cutting, copying, or deleting an event will affect all events in the same group. If you need to delete a single event, you can choose* **Ignore Event Grouping** *from the* **Options** *menu to temporarily ignore grouping.*

1. Select the events to be copied. *For more information, see* *Selecting multiple events on page 72*.
2. Select a time range, if applicable.
3. Click the **Copy** button ( ).

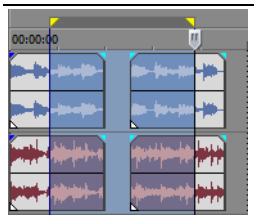
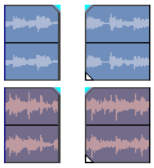
### Copying selected events

When copied, selected events are reproduced and placed on the clipboard. Time information is also placed on the clipboard.

| Events before copy | Clipboard contents | Events after copy |
|---|---|---|
|  |  | The original events are not affected and do not change. |

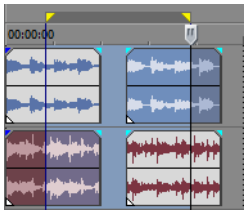
### Copying a time selection

Events within the time selection and across all tracks are reproduced and placed on the clipboard. Time information is also placed on the clipboard.

| Events before copy | Clipboard contents | Events after copy |
|---|---|---|
|  |  | The original events are not affected and do not change. |

### Copying a time selection and events

Events and portions of selected events within the time selection are reproduced and placed on the clipboard. Time information is also placed on the clipboard.

| Events before copy | Clipboard contents | Events after copy |
|---|---|---|
|  | | The original events are not affected and do not change. |

## Cutting events

Cutting events removes them from their respective tracks, but places the cut information (events and time) on the clipboard. Once on the clipboard, you can paste the information into your project.

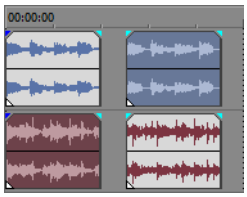
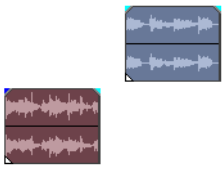
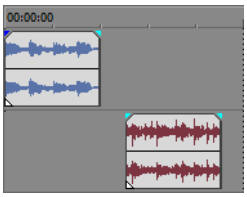
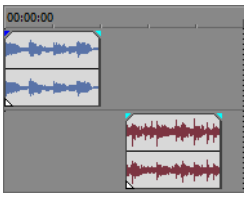
### Tips:

- *When the* **Cut, copy, and delete grouped events** *check box on the* **Editing** *tab of the Preferences dialog is selected, cutting, copying, or deleting an event will affect all events in the same group. If you need to delete a single event, you can choose* **Ignore Event Grouping** *from the* **Options** *menu to temporarily ignore grouping.*
- *You can apply a ripple edit after cutting. For more information, see* *Applying post-edit ripples on page 87*.

1. Select events or a time range. *For more information, see* *Making selections on page 72*.
2. Click the **Cut** button ( ).

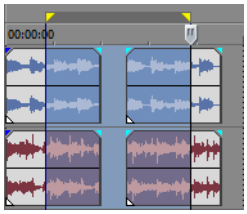
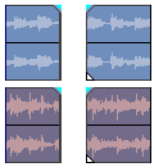
### Cutting selected events

When cut, selected events are removed from the timeline and placed on the clipboard. Time information is also placed on the clipboard.

| Events before cut | Clipboard contents | Events after cut | Events after cut in post-edit ripple mode |
|---|---|---|---|
|  |  |  |  |

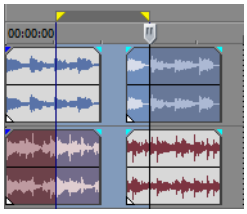
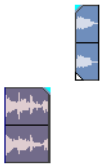
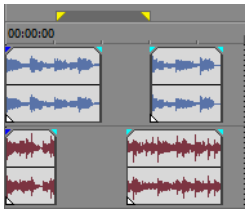
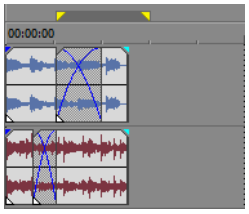
### Cutting a time selection

Events within the time selection are reproduced and placed on the clipboard. Time information is also placed on the clipboard. When cutting a time selection, auto ripple mode affects the position of material on all tracks or affected tracks after the cut.

| Events before cut | Clipboard contents | Events after cut | Events after cut in post-edit ripple mode |
|---|---|---|---|
|  |  | | |

### Cutting a time selection and events

Events and portions of selected events within the time selection are reproduced and placed on the clipboard. Time information is also placed on the clipboard. When cutting a combination of time selection and event selection, post-edit ripple mode affects the position of material on all tracks or the tracks of selected events after the cut.

| Events before cut | Clipboard contents | Events after cut | Events after cut in post-edit ripple mode |
|---|---|---|---|
|  |  |  |  |

## Pasting events

Once information is copied to the clipboard, you can choose a variety of ways to paste the clipboard items. Items are always pasted from the cursor's position along the timeline.

**Tip:** *When the* **Cut, copy, and delete grouped events** *check box on the* **Editing** *tab of the Preferences dialog is selected, cutting, copying, or deleting an event will affect all events in the same group. If you need to delete a single event, you can choose* **Ignore Event Grouping** *from the* **Options** *menu to temporarily ignore grouping.*

When post-edit ripple mode is enabled, material is pushed down the track to make room for pasted material. The exact behavior of the ripple depends on what is being pasted, and the type of ripple edit you chose to perform. If one or more events are pasted, only those tracks where pasted material appears are ripple edited.

**Tip:** *You can apply a ripple edit after pasting. For more information, see* *Applying post-edit ripples on page 87*.

1. Move the cursor to the desired location on the timeline.
2. Click either the track number or within the track where you want to paste the event. This track is the focus track; there can be only one focus track at a time.

**Note:** *If you are pasting multiple events from different tracks, new tracks are automatically created as needed.*

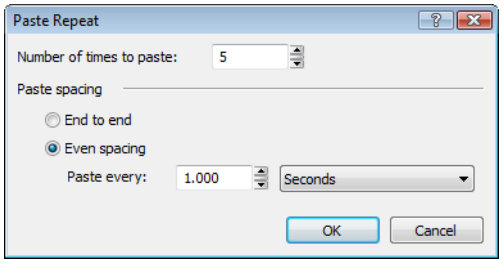
3. Click the **Paste** button ( ).

   Clipboard events are pasted at the cursor position on the track. Existing track events can be overlapped with newly pasted information.

### Using paste repeat

Use paste repeat to specify how many times clipboard events are pasted at the cursor position on the selected track and to specify the space between pasted events.

1. Copy a selection to the clipboard.
2. From the **Edit** menu, choose **Paste Repeat**. The Paste Repeat dialog is displayed.

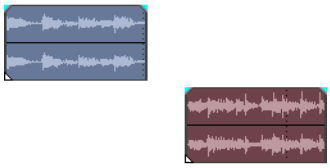
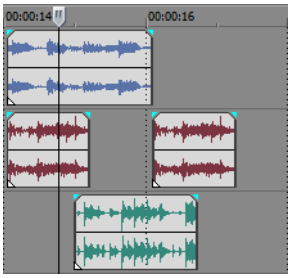
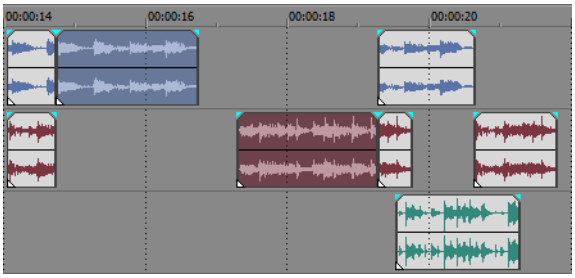



3. Specify the number of times to paste the clipboard contents and the space between successive copies.
4. Click **OK**.

### Using paste insert

When using paste insert, clipboard events are placed at the cursor position on the selected track and existing events on all tracks are moved further down the timeline by the total length of pasted information. This action differs from post-edit ripple mode because pasting in post-edit ripple mode affects only the tracks in which material is pasted, while paste insert affects all tracks in the project.

1. Copy a selection to the clipboard.
2. From the **Edit** menu, choose **Paste Insert**.

| Clipboard contents | Events before paste insert | Events after paste insert |
|---|---|---|
|  |   |   Events on all tracks (not just tracks with pasted material) are pushed down the timeline. |

### Punching-in and crossfading events

You can insert events into the middle of (on top of) existing events without altering the timing of the project. When the inserted event ends, the original event continues playing as if it had never stopped.

You can choose the duration of crossfades for punched-in audio events.

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **Editing** tab.
3. Select **Quick fade length of audio events**. Specify a duration for each transition.

Events that have previously been inserted or punched-in are not affected by this change. The concept of punching in and out only applies when you are inserting an event that is shorter than the event that it is being inserted into. In the following illustration, every frame is numbered so that you can see how the original event continues after the inserted event ends, as if it continued to play underneath the original.

### Duplicating events

Duplicating is a combination of copying and pasting in one action. The process is like moving the event to a new position while leaving a copy behind.

1. Press Ctrl.
2. Drag the event you want to duplicate to the place where you want the new event to be positioned.

### Inserting empty events and time

You can insert events into the timeline that do not have any contents and are not references to any media files. Empty events are useful as placeholders in the timeline that can be filled with media or recorded into at a later time. In either case, the new media is added to the empty event as a take. To add an empty event to a track, choose **Empty Event** from the **Insert** menu.

You can also make space in a project by inserting a length of time across all tracks. To insert a period of time into the timeline, choose **Time** from the **Insert** menu.

## Trimming events

This section describes simple ways to trim events.

**Tip:** *You can apply a ripple edit after trimming an event. For more information, see Applying post-edit ripples on page 87.*

### Trimming an event

During the trimming process for a video event, both the last thumbnail image on the event and the Video Preview window show the last frame in the event, allowing you to edit events very accurately.

1. Move the cursor over the edge of the event. The cursor changes when properly positioned ( ).
2. Drag the edge of the event to trim it.

Because a multimedia file often has both a video and an audio component, both events are trimmed (or extended) as a group unless you ungroup them or temporarily suspend grouping by clicking the **Ignore Event Grouping** button ( ). *For more information, see Grouping events on page 188.*

Trimming grouped events at the same time

### Trimming an event beyond its end

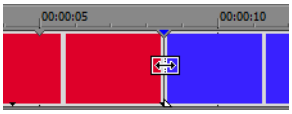
You can trim an event beyond its end, extending it as a result. Once extended, the event loops as a default. A notch indicates where the looped event repeats.

Alternately, you can turn looping off and make the last frame of an event's media repeat for the duration of the event (a freeze frame). A notch appears at the point in the event where the video ends and the freeze frame begins. *For more information, see Loop on page 179.*

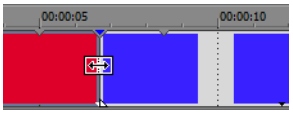
### Trimming adjacent events

You can trim adjacent events simultaneously. Press Ctrl+Alt while dragging the common edge between two adjacent events. The trim adjacent cursor appears ( ).

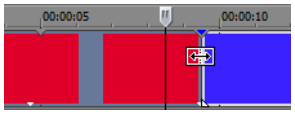
Press Ctrl+Alt over the boundary between two events...




...and drag left...




...or right to trim both events at once.

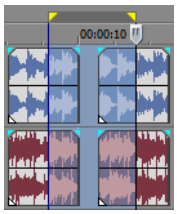
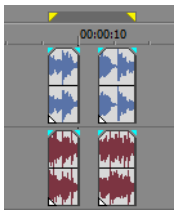


### Trimming a time selection

Trimming events removes all media *outside* the time selection. The removed information is not placed on the clipboard. Trimming is different from cutting in that the events *within* the time selection are preserved.

1. Select a time range. *For more information, see Selecting a time range on page 73.*
2. Press Ctrl+T or, from the **Edit** menu, choose **Trim.**

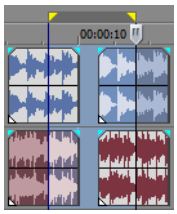
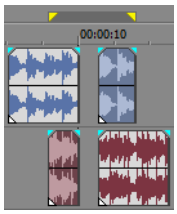
   The material outside the time selection (across all tracks) is removed from the project. However, the time information (space) between events is not removed.

| Events before trim | Clipboard contents | Events after trim |
|---|---|---|
|  | Trimmed information is not placed on the clipboard. |  |

### Trimming a time and event selection

1. Select the events to be trimmed.
2. Select a time range. *For more information, see Selecting events and a time range on page 75.*
3. Press Ctrl+T or, from the **Edit** menu, choose **Trim.**

Only the portion of selected events outside the time selection is trimmed. Unselected events remain. The time information (space) between events is not removed.

| Events before trim | Clipboard contents | Events after trim |
|---|---|---|
|  | Trimmed information is not placed on the clipboard. |  |

### Edge trimming events using the keyboard

With this method, you can quickly jump through your project and adjust cuts until they're perfectly synchronized. If you have an external multimedia controller, it's even easier.

1. If you want downstream events to ripple as you trim, click the **Auto Ripple** button ( ) to turn on Auto Ripple mode.
2. Select the event you want to trim.
3. Press 7 or 9 on the numeric keypad to move the cursor to the event edge you want to trim. 7 selects the beginning of an event or moves to the previous event edge. 9 selects the end of the event or moves to the next event edge. A red bracket is displayed to indicate which event edge will be trimmed.

> **Note:** *You can also perform this step using the bracket ([ or ]) keys.*

4. Use the 1, 3, 4, and 6 keys on the numeric keypad to trim the current event edge:
   - Press 1 to trim one video frame left, or press 3 to trim one video frame right (or hold Ctrl+Shift+Alt while rolling the mouse wheel).
   - Press 4 to trim one pixel left, or press 6 to trim one pixel right (or hold Ctrl+ Shift while rolling the mouse wheel). Depending on the current zoom level, the trim duration will vary.

> **Note:** *Pressing 5 on the numeric keypad exits edge-trimming mode. If you are not in edge-trimming mode, 1, 3, 4, and 6 on the numeric keypad to nudge events on the timeline by frame (1 and 3) or by pixel (4 and 6).*

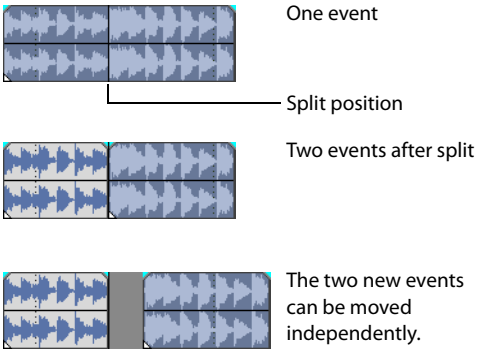
5. Repeat steps 3 and 4 as necessary.

## Splitting events

You can create multiple, independently functioning events from a single event by splitting it. Splitting creates a new ending point for the original event and creates a starting point for the newly created event.

Splitting an event does not alter the original media. The original media file's information is there, but is omitted for playback based on where the event's starting or ending point occurs on the timeline.

When split, the two new events are flush against one another. The two events can be moved independently.



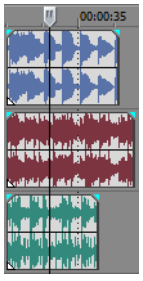
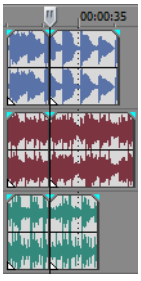

### Splitting an event

1. Select the events to be split. *For more information, see Making selections on page 72.*
2. Place the cursor at the timeline position where the split will occur.
3. From the **Edit** menu, choose **Split**, or press S.

   The selected events are split at the cursor position.

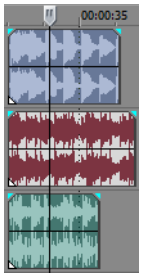
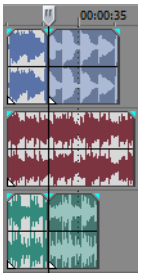
### Splitting all events at the cursor

All events are split at the cursor's position (unless an event is locked). The split occurs across all tracks (if no events are selected).

| Events before splitting | Events after splitting |
|---|---|
|  |  |

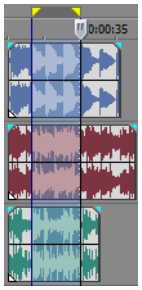
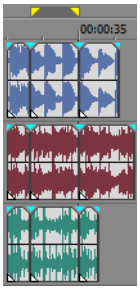
### Splitting selected events

Only the selected events are split at the cursor's position.

| Events before splitting | Events after splitting |
| --- | --- |
|  |  |

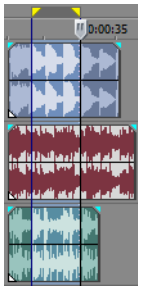
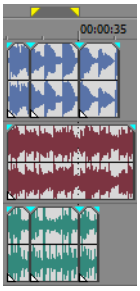
### Splitting a time selection

Unless locked, all events within the time selection are split at the starting and ending points of the time range, meaning that two splits are made. The split occurs across all tracks.

| Events before splitting | Events after splitting |
| --- | --- |
|  |  |

### Splitting a time selection across selected events

Only selected events within the time selection are split at the starting and ending points of the time range.

| Events before splitting | Events after splitting |
| --- | --- |
|  |  |

#### Splitting and trimming events

Hold Ctrl+Alt+Shift and click an event to split the event. Hold Ctrl+Alt+Shift and drag an event to split it at the point you click and trim the event in the direction you drag. The cursor changes to the split-trim cursor (↔).

**Tip:** *Holding the Shift key temporarily overrides snapping if it is enabled. Release the Shift key while dragging to snap the event to available snap points.*

### Slipping and sliding events

To help you picture what happens when you slip and slide events, think of an event as a window to a media file. The window can display the entire media file or a small section. When the window displays only a portion of the media file, you can move either the window or the underlying media to adjust the media that is played by an event:

- When you **slip** an event, your event maintains its place on the timeline, but the media file moves in the direction you drag.
- When you **slide** an event, the media file maintains its place on the timeline, but the event moves in the direction you drag.

**Tip:** *You can also slip or slide grouped events (at the same time) or slide a crossfade between two events. For more information, see* *Grouping events on page 188 or Sliding a crossfade on page 91*.

#### Shifting the contents of (slipping) an event

Press Alt while dragging an event. The slip cursor appears (↔).

As you drag the event, the contents of the event shift, but the event does not move. You can use this technique when you want to maintain an event's length and position, but have the event play a different section of the source media file.

#### Slip-trimming an event

Press Alt while dragging the right or left edge of an event. The slip-trim cursor appears (↔).

As you drag the event edge, the media moves with the event edge.

**Tips:**

- *Press Alt+Shift while dragging any portion of an event to slip-trim the right edge. The left edge of the event remains fixed on the timeline, and the media is slipped past the left edge of the event. This slip mode is useful when you want to slip an event without changing its last frame.*
- *Press Ctrl+Alt+Shift and drag an event to split it at the point you click and trim the event in the direction you drag.*
- *To slip all of an event's takes when slipping media, make sure* **Slip All Takes** *is selected in the Options menu.*

#### Sliding an event

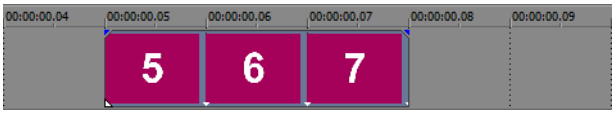
Press Ctrl+Alt while dragging an event. The slide cursor appears (↔).

As you drag, the relative position of the media remains fixed on the track, and the event position changes. You can use this technique when you want to maintain an event's length, but have the event play a different section of the source media file at a different point in your project.

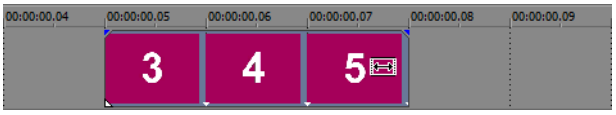
*For more information, see* *Applying post-edit ripples on page 87*.

**Tip:** *You can apply a ripple edit after slip-trimming or sliding an event.*

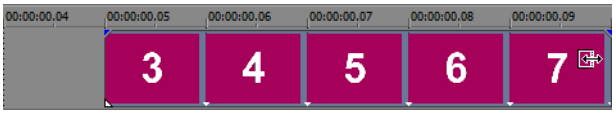
The original media file.



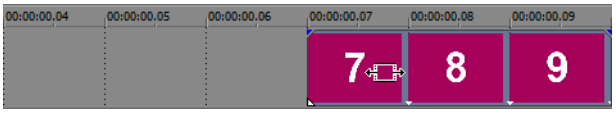

The event on the timeline with original frames.




Slipping the event two frames to the right.




Slip-trimming the event two frames to the right.




Sliding the event two frames to the right.

### Detecting and repairing audio and video synchronization problems

When audio and video events are not aligned, Vegas Pro software will highlight the events in the timeline so you can see synchronization problems at a glance.

The software determines whether events are synchronized by comparing grouped and overlapping events:

- An event in a group is compared to other events in the same group (of the opposite media type) that were created from the same media, and the events with the most overlap are used to calculate synchronization. If no events overlap, the closest events are used to calculate synchronization.
- An event that is not in a group is compared to events (of the opposite media type) that were created from the same media, and the events with the most overlap are used to calculate synchronization. If no events overlap, no synchronization offset is displayed.

**Note:** *The amount of offset is displayed when the* **Active Take Information** *option is selected on the* **View** *menu. Very small offsets that are below the resolution of the timeline might be displayed as 0.00. Set the project time format to samples to see the offset amount.*

To restore synchronization, right-click the audio or video event you want to synchronize, choose **Synchronize** from the shortcut menu, and then choose a command from the submenu:

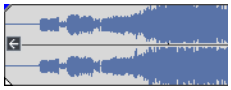
| Command | Description |
|---|---|
| **By Moving** | Moves the event you clicked so it is synchronized to its corresponding audio or video event. |
| **By Slipping** | Slips the contents of the event you clicked so the audio and video are synchronized. The events do not move, but the contents of the event you right-click are shifted forward or backward to restore synchronization. |

### Reversing events

Reversed events are perfect for backward guitar solos, creating the illusion of turning back time, or whatever else you can dream up. The event plays backward on the timeline without affecting the source media.

1. Right-click an audio or video event in the timeline.
2. Choose **Reverse** from the shortcut menu. The event is reversed on the timeline, and a subclip is created in the Project Media list for the reversed event. *For more information about subclips, see Using subclips on page 113.*

   An arrow is displayed on the event to indicate that it has been reversed:



### Deleting events

Deleting an event removes it from its track. Multiple events can be deleted and time selections can be used to modify the process. Ripple editing also applies to delete actions. Deleting operates exactly like a cutting operation, but the removed information is *not* placed on the clipboard. *For more information, see Cutting events on page 77.*

1. Select the events to be deleted.
2. Press Delete.

## Applying post-edit ripples

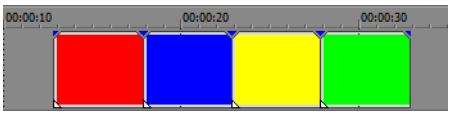
You can apply a post-edit ripple that affects either the edited track(s), the track(s) and certain project elements, or everything in the timeline. The power lies in the fact that you can apply this post-edit ripple to a wide variety of editing tasks, such as trimming, crossfading, cutting, pasting, and deleting events. You can also choose to apply your ripple edits manually or automatically.

You can ripple the contents of the timeline following an edit after performing these tasks:

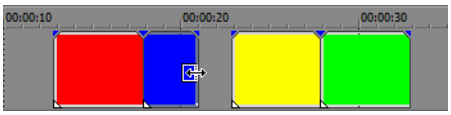
- Trimming, slip-trimming, and sliding events
- Time compressing/stretching events
- Cutting events
- Pasting events
- Deleting events

Ripple editing also affects how material is added from the Trimmer window. *For more information, see Using the Trimmer window on page 108.*

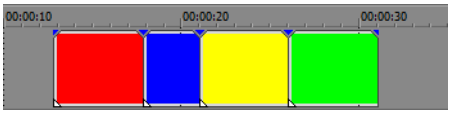
The original four events




Trimming the second event



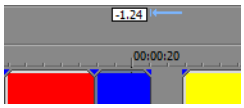

After applying a post-edit ripple, the third and fourth events close the gap




A quick and easy method is also provided for shuffling a sequence of events on a track. Decide that the third event in a series should really be the second instead? You can drag the event to a new position and instruct the software to shuffle the events into their new order.

### Applying a post-edit ripple manually

1. Perform one of edits discussed above. Above the timeline, an arrow indicates where the post-edit ripple will occur and the direction the affected events will move.



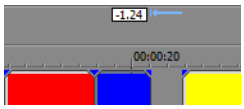

2. From the **Edit** menu, choose **Post-Edit Ripple**, and choose a command from the submenu:
   - **Affected Tracks** ripples only the tracks where you performed the edit.
   - **Affected Tracks, Bus Tracks, Markers, and Regions** ripples the tracks where you performed the edit and ripples any keyframes or envelopes on those tracks. This command also ripples any markers, regions, CD layout markers, and command markers in the project.
   - **All Tracks, Markers, and Regions** ripples all tracks and all keyframes and envelopes on those tracks. This command also ripples any markers, regions, CD layout markers, and command markers in the project.

   The timeline is rippled after the edit according to the option you choose.

**Tip:** *You can press F after an edit to ripple the affected tracks, or you can press Ctrl+F to ripple markers, keyframes, and envelopes, too. To ripple everything after an edit, press Ctrl+Shift+F.*

### Applying a post-edit ripple automatically

1. Click the arrow button next to the **Auto Ripple** button ( ) and choose a ripple type:
   - **Affected Tracks** ripples only the tracks where you performed the edit.
   - **Affected Tracks, Bus Tracks, Markers, and Regions** ripples the tracks where you performed the edit and ripples any keyframes or envelopes on those tracks. This command also ripples any markers, regions, CD layout markers, and command markers in the project.
   - **All Tracks, Markers, and Regions** ripples all tracks and all keyframes and envelopes on those tracks. This command also ripples any markers, regions, CD layout markers, and command markers in the project.
2. Perform one of edits discussed above. Above the timeline, an arrow indicates where the post-edit ripple will occur, the direction the affected events will move, and the distance the events will move.

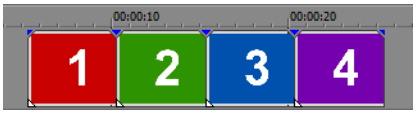



3. The timeline is rippled after the edit according to the ripple type you choose.

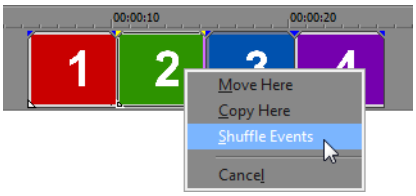
### Shuffling events

A quick way to change the order of a sequence of events in a track is provided. Right-click and drag an event to a new location in the track and choose **Shuffle Events** from the shortcut menu that appears. The events are shuffled into the new order.

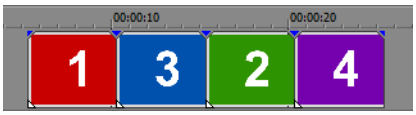
The original four events




Right-click and drag event 3 between events 1 and 2

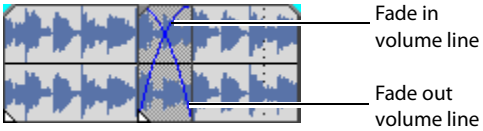



The four events after the shuffle



## Crossfading events

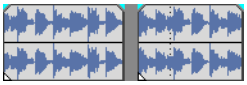
You are allowed to crossfade between two events on the same track. For audio events, crossfading fades out one audio event's volume while another event's volume fades in. For video events, crossfading creates a transition between two events, one fading out while the other fades in. Lines appear indicating how and when the event's volume or transparency is being affected.



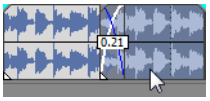

### Using automatic crossfades

The automatic crossfade feature turns the overlapping portions of two events into a smooth crossfade. This feature is turned on as a default. Click the **Automatic Crossfades** button ( ) or press Ctrl+Shift+X to turn automatic crossfades on and off.

Events before crossfade



Events after crossfade



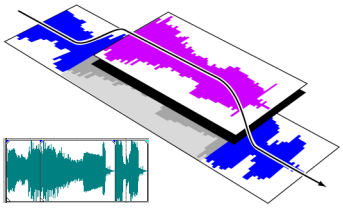

Drag one event to overlap the other

An option is provided for creating automatic crossfades when you add multiple media files to a track. *For more information, see* *Automatically crossfading inserted events on page 52*.

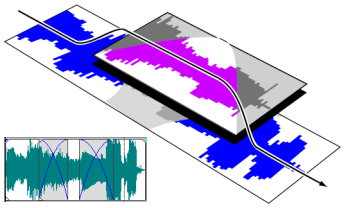
### Manually setting a crossfade

An automatic crossfade is not inserted if a shorter event is placed on top of and within the same time frame of a longer event. In this case, the longer event begins playing, then the shorter event plays, and then the longer event resumes playing at the timeline position. You can manually create a crossfade to fade in and out of the shorter event.

1. Place the mouse pointer on one of the shorter event's handles. The envelope cursor appears ( ).
2. Drag the handle to the desired position.



Events without crossfade

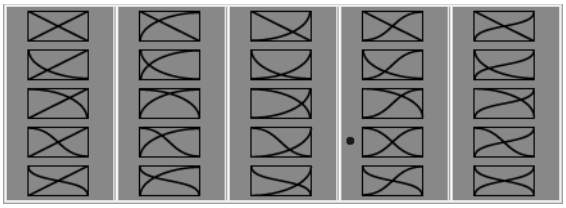


Events with manual crossfade

This is a fast and effective method of inserting a voiceover on top of a background music track (although the music fades out completely) or to replace a bad section of audio. *For more information, see* *Punching-in and crossfading events on page 80*.

### Changing crossfade curves

You can change the crossfade curves that are used to fade in and out between two events.



Right-click a crossfade to choose a different crossfade curve.

1. Right-click anywhere in the crossfade region to display a shortcut menu.
2. From the shortcut menu, choose **Fade Type**, and choose the desired fade type from the submenu.

**Tip:** *If you use the same crossfade curve frequently, you can set it as a default for all new audio or video crossfades on the Editing tab of the Preferences dialog. For more information, see Editing tab on page 427.*

### Sliding a crossfade

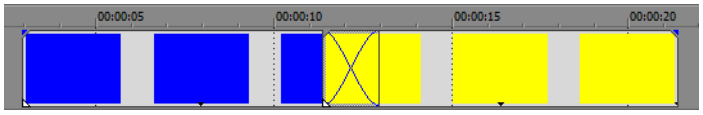
You can slide a crossfade between two events without affecting the total length of the two overlapping events. This process is similar to sliding and slipping events.

*For more information, see Slipping and sliding events on page 85.*

Press Ctrl+Alt while dragging the overlapping area between two events. The slide crossfade cursor appears ( ).

As you drag, the relative position of the media remains fixed on the track, and the crossfade position changes, effectively trimming the edge of the event in the direction you drag. You can use this technique when you want to maintain the length of two combined events but want the transition to occur earlier or later.

Two events with a crossfade.




Sliding the crossfade to the left...

...and to the right.

## Using undo and redo

You are given unlimited undo and redo functionality while working on your project, even to the extent of being able to undo changes made before the last time a project was saved (but not closed). While you are working with a project, an undo history of the changes that you have performed is created. Each time you undo something, that change is placed in the redo history.

When you close the project or exit the software, both the undo and redo histories are cleared.

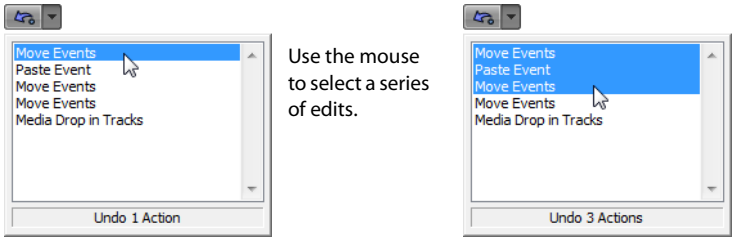
### Using undo

Pressing Ctrl+Z or clicking the **Undo** button ( ) reverses the last edit performed. Repeatedly using the keyboard command or toolbar button continues undoing edits in reverse order, from most recent to oldest. In addition, you can undo the last edit by choosing it from the **Edit** menu.

### Undoing a series of edits

You can undo a series of edits by using the drop-down list on the **Undo** button.

1. Click the arrow to the right of the **Undo** button ( ).
2. From the drop-down list, choose the edit that you want to undo. Items above it (subsequent edits) are selected automatically. Your project is restored to the state prior to those edits.




When you undo an edit or a series of edits, they are added to the redo history. This feature allows you to restore your project to a previous state.

**Tip:** *From the* **Edit** *menu, choose* **Undo All** *to undo all edits in the history. All edits are undone and added to the redo history.*

## Using redo

Pressing Ctrl+Shift+Z or clicking the **Redo** button ( ) redoes the last undo performed. Repeatedly using the keyboard command or toolbar button continues redoing undos in reverse order, from most recent to oldest. In addition, you can redo the last edit by choosing it from the **Edit** menu.

### Redoing a series of edits

You can view the redo history by clicking the arrow on the right side of the **Redo** button ( ). The top item in the list that appears is the most recent undo edit. If you redo a specific edit that appears farther down the list, all subsequent edits above it are redone as well.

When you redo an edit or a series of edits, they are added to the undo history again. The redo history is cleared when a new edit is performed.

## Clearing the edit history

You can clear both undo and redo histories without closing your project or exiting the software. Once the histories have been cleared, a new edit history is created as you continue working on the project. While clearing the edit history is not usually necessary, it can free up disk space. To clear the edit history, choose **Clear Edit History** from the **Edit** menu.

## Adding project markers and regions

Several types of project markers are provided that identify parts of your project, serve as cues, and provide additional functionality:

- **Markers** are points that you mark along the project's timeline. They are typically used to mark locations in the project for later reference or to mark timing cues.
- **Regions** are ranges of time that you mark along the timeline. Regions identify ranges of time for your reference and can function as permanent time selections.
- **Command markers** are markers that enable metadata in streaming media files. These markers can be used to display headlines or captions, link to Web sites, or perform any other function you define. *For more information, see Adding captions to Windows Media Video (WMV) files on page 298.*

  In addition, these markers can be used to embed Scott Studios data information, which is used extensively in broadcasting.
- **CD layout markers** are markers that indicate tracks and indices for an audio CD layout. These marks are used to create tracks and index points when burning an audio CD.

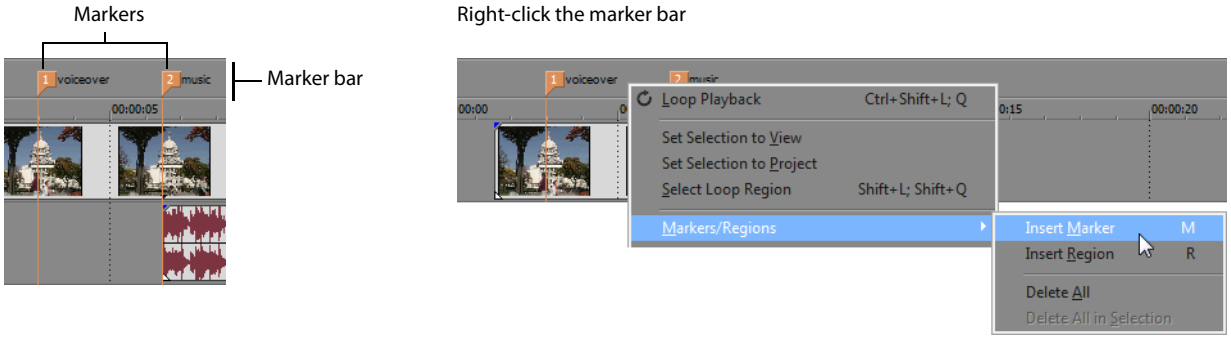
  *For more information, see Understanding tracks and indices on page 387.*

**Tip:** *You can use ripple editing to automatically move markers and regions as you edit in the timeline. For more information, see Applying post-edit ripples on page 87.*

### Working with markers

Markers are useful for identifying and navigating to specific locations in longer projects. As you place markers in your project, they are automatically numbered (up to 99) in the order that they are placed. Markers appear as orange tags above the ruler. You can name them and reposition them along the project's timeline.

If you choose to save markers in your rendered MPEG-2 file, DVD Architect® Pro will read those markers as chapter markers. Ensure the **Render I-frames at markers** check box is selected before rendering (in the Render As dialog, choose **MainConcept MPEG-2** from the **Template** drop-down list, and then click the **Custom** button. In the Custom Template dialog, select the **Video** tab and select the **Render I-frames at markers** check box).




#### Inserting a marker at the cursor

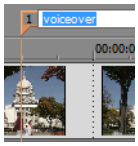
1. Position the cursor where you want to place the marker.
2. From the **Insert** menu, choose **Marker**, or press M.
3. Type a name for the marker and press Enter. If you do not want to name the marker, simply press Enter.

#### Inserting a marker during playback

During playback, press M. The marker appears on the marker bar. You can name the marker after it has been set.

### Naming (or renaming) a marker

1. Place the mouse pointer on the marker you want to name or rename. The pointer changes to a hand icon ( ).
2. Right-click to display a shortcut menu.
3. From the shortcut menu, choose **Rename**. A text box opens next to the marker.




4. Type the marker name.
5. Press Enter to set the marker's name.

You can also double-click an existing name or double-click the space just to the right of a marker to rename it.

### Moving markers

You can reposition a marker by dragging it on the marker bar.

### Navigating to markers

You can jump the cursor to any marker on the timeline by clicking the marker. You can also jump to a marker by pressing the number keys along the top of the keyboard (*not* the numeric keypad).

> **Tip:** *Jump the cursor to the next or previous marker by pressing Ctrl+Right Arrow or Ctrl+Left Arrow.*

### Deleting markers

1. Place the mouse pointer on the marker that you want to delete. The pointer changes to a hand icon ( ).
2. Right-click to display a shortcut menu.
3. From the shortcut menu, choose **Delete**. The marker is removed from your project.

The tags are not renumbered as you remove them. For example, if you have five markers in your project and delete markers 3 and 4, the remaining markers will be listed as 1, 2 and 5. However, as you add markers again, Vegas Pro software begins numbering the missing sequence first, in this case 3 and 4, then 6, 7, and 8.

### Deleting all markers and regions

1. Right-click the marker bar.
2. From the shortcut menu, choose **Markers/Regions**, and choose **Delete All** from the submenu.

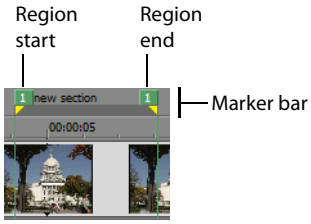
## Working with regions

Regions identify ranges of time and provide a way to subdivide your project. A region is defined as the area between two region markers that share the same number. Regions can function as semi-permanent time selections. You can view region information in the Explorer by clicking the arrow next to the **View** button ( ) and selecting **Region View**.

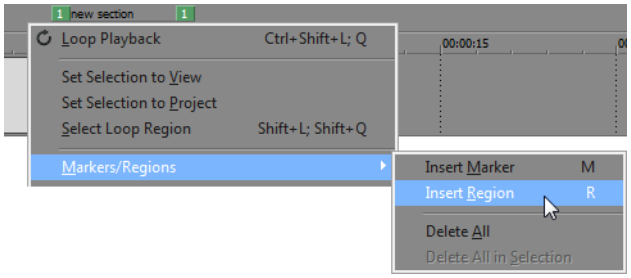
### Inserting regions

1. Make a time selection. *For more information, see Selecting a time range on page 73.*
2. From the **Insert** menu, choose **Region**, or press R.
3. Type a name for the region and press Enter. If you do not want to name the region, simply press Enter.

   Region tags are displayed at the beginning and end points of the time selection.




Right-click the marker bar

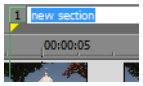



### Moving regions

Drag a region tags to reposition it. To move both region tags (start and end tags) at once, hold Alt while dragging a region tag.

### Naming regions

1. Place the mouse pointer on the left region tag you want to name or rename. The pointer changes to a hand icon (☝).
2. Right-click to display a shortcut menu.
3. From the shortcut menu, choose **Rename**. A text box appears next to the region tag.

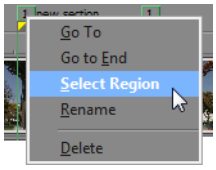



4. Type the region's name.
5. Press Enter or click anywhere in the timeline to set the name.

### Selecting regions

You can select the events, across all tracks, within the region for editing or playing back.

1. Right-click one of the region tags to display a shortcut menu.



Selected region

2. From the shortcut menu, choose **Select Region**.

> **Tip:** *You can also select a region by pressing a number on your keyboard (not the numeric keypad) or by double-clicking a region marker.*

### Navigating to regions

You can move the cursor to the start or end of a region by clicking either region marker. You can press Ctrl+Right Arrow or Ctrl+Left Arrow to move the cursor to the next or previous region markers.

Right-click a region marker to display a shortcut menu that allows you to navigate to the beginning **(Go to Start)** or the end (**Go to End)** of a region.

### Deleting regions

1. Place the mouse pointer on the region marker's starting or ending point. The pointer changes to a hand icon ( ).
2. Right-click to display a shortcut menu.
3. From the shortcut menu, choose **Delete**. The region is removed from your project.

The tags are not renumbered as you remove them. For example, if you have five regions in your project and delete region 3 and 4, the remaining regions are listed at 1, 2 and 5. However, as you add regions again, Vegas Pro software begins numbering the missing sequence first, in this case 3 and 4, and then 6, 7, and 8.

### Deleting all regions and markers

1. Right-click the marker bar.
2. From the shortcut menu, choose **Markers/Regions**, and choose **Delete All** from the submenu.

## Working with command markers

Command markers add interactivity to a multimedia presentation streamed over the Internet by inserting metadata into streaming media files. As your video plays, any number of other actions can be programmed to occur. These commands are a part of the Microsoft® Windows Media® and RealMedia® streaming formats. Most frequently, these actions add text or open a related Web site where the viewer can find more information about the topic at hand. The specific commands available vary depending on the final format of your project.

**Note:** *Windows Media Player 9 will ignore metadata commands unless the* **Run script commands when present** *check box is selected on the* **Security** *tab of the player's Preferences dialog. Be sure to instruct your audience to select this check box before playing your file.*

You can use command markers to add captions to your project. *For more information, see Adding captions to Windows Media Video (WMV) files on page 298.*

Command markers can also indicate when an instruction (function) will occur in a WAV file being used in a radio broadcast environment (Scott Studios data). The following two sections define the markers for both streaming media and Scott Studios files.

**Note:** *While streaming media files can be played on any hard drive or CD drive, they require a special streaming media server (provided by your Internet service provider) to stream properly across the Internet.*

**Defining streaming media commands**

In a streaming media file, command markers can be used to display headlines, show captions, link to Web sites, or any other function you define. Several command types are included that you can add to a streaming media file. Some command types are exclusive to either the Windows Media or the RealMedia player.

| Command | Player type | Description |
|---|---|---|
| **URL** | Windows Media and RealMedia | Indicates when an instruction is sent to the user's Internet browser to change the content being displayed. With this command, you enter the URL that displays at a specific time during the rendered project's playback. |
| **Text** | Windows Media | Displays text in the captioning area of the Windows Media Player located below the video display area. You enter the text that will display during playback.<br><br>**Note:** *To view captions during playback in Windows Media Player 9, choose* **Captions and Subtitles** *from the Windows Media Player* **Play** *menu, and then choose* **On if Available** *from the submenu.* |
| **WMClosedCaption** | Windows Media | Displays the entered text in the captioning window that is defined by an HTML layout file. |
| **WMTextBodyText** | Window Media | Displays the entered text in the text window that is defined by an HTML layout file. |
| **WMTextHeadline** | Windows Media | Displays the entered text in the headline window that is defined by an HTML layout file. |
| **Title** | RealMedia | Displays the entered text on the RealPlayer's title bar.<br><br>**Note:** *When rendering Windows Media files, title information is based on the settings on the Summary tab of the Project Properties dialog or the Index/ Summary tab of the Custom Template dialog. The summary information from the Project Properties dialog will be used if information has been specified in both places.*<br><br>*To view this information during playback, choose* **Now Playing Options** *from the Windows Media Player* **View** *menu and select the items you want to display.* |
| **Author** | RealMedia | Displays the entered text (Author's name) when a user selects **About This Presentation** from the RealPlayer's shortcut menu.<br><br>**Note:** *When rendering Windows Media files, author information is based on the settings on the Summary tab of the Project Properties dialog or the Index/ Summary tab of the Custom Template dialog. The summary information from the Project Properties dialog will be used if information has been specified in both places.*<br><br>*To view this information during playback, choose* **Now Playing Options** *from the Windows Media Player* **View** *menu and select the items you want to display.* |
| **Copyright** | RealMedia | Displays the entered copyright information when a user selects **About This Presentation** from the RealPlayer's shortcut menu.<br><br>**Note:** *When rendering Windows Media files, copyright information is based on the settings on the Summary tab of the Project Properties dialog or the Index/ Summary tab of the Custom Template dialog. The summary information from the Project Properties dialog will be used if information has been specified in both places.*<br><br>*To view this information during playback, choose* **Now Playing Options** *from the Windows Media Player* **View** *menu and select the items you want to display.* |

### Defining Scott Studios data commands

For .wav files using Scott Studios data, command markers can be used to define information about the file.

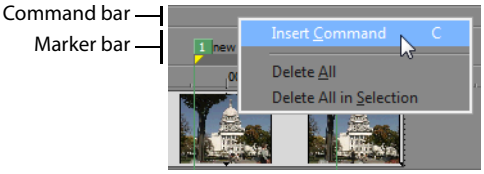
| Command | Description |
|---|---|
| **SCOTT EOM** | Calculates when the next queued clip starts playing in a Scott Studios system. For more information, refer to your Scott Studios documentation. |
| **SCOTT Cue In** | Set the beginning of a file in a Scott Studios System without performing destructive editing. For more information, refer to your Scott Studios documentation. |

### Defining closed captioning commands

| Command | Description |
|---|---|
| **608CC1** | Used for primary-language closed captions.<br>In the **Comment** box, type the closed caption control commands.<br>**Tips:**<br>• *If you type captioning text in the* **Comment** *box and do not specify captioning markup, a pop-on caption is created.*<br>• *You can use your keyboard to create standard text and punctuation. To insert special characters and punctuation, use the Character Map (***Start** > **All Programs** > **Accessories** > **System Tools** > **Character Map***).*<br>*For more information about closed captioning, see Adding closed captioning to video files on page 289.* |
| **608CC3** | Used for secondary-language closed captions.<br>In the **Comment** box, type the closed caption control commands. |

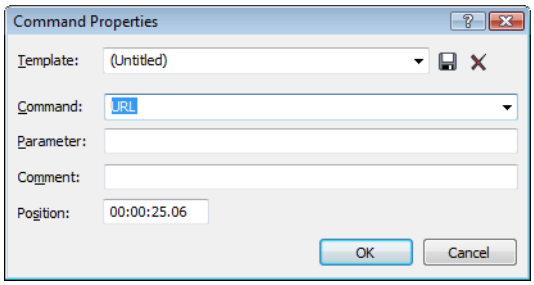
### Inserting command markers

Command markers appear as blue tags on the command bar, which is above the marker bar.




Right-click to place a command marker on the command bar.

1. Position the cursor where you want to place the command marker.
2. From the **Insert** menu, choose **Command**, or press C.
3. Complete the Command Properties dialog:




- If desired, choose a custom template from the **Template** drop-down list. *For more information, see Saving command properties as a custom template on page 99.*
- Choose the type of command from the **Command** drop-down list.
- In the **Parameter** box, type parameters to define the behavior of the command.
- Type your own notes or comments in the **Comments** box.

- Specify the timing of the command in the **Position** box. Otherwise, command markers are automatically set to the current cursor position.

4. Click **OK**. The new command marker appears on the command bar.

#### Editing command properties

Double-click any command marker to open the Command Properties dialog and edit its contents. You can also right-click a command marker and choose **Edit** from the shortcut menu.

#### Saving command properties as a custom template

If you plan to use a command more than once, you can save command properties as a template. You can then reuse the command properties by choosing the template from the **Template** drop-down list.

1. Create a command and complete the Command Properties dialog.
2. Type a name for the template in the **Template** box.
3. Click the **Save Template** button ( ).

**Note:** *Your metadata command templates are saved in the cmdtemp.xml file. You can edit this file directly to modify your templates. This file is stored in C:\Users\<user name>\AppData\Roaming\Sony\Vegas Pro\11.0.*

*The AppData folder is not visible unless the* **Show hidden files and folders** *radio button is selected on the* **View** *tab of the Windows Folder Options control panel.*

#### Deleting command markers

1. Place the mouse pointer on the command marker. The pointer changes to a hand icon ( ).
2. Right-click to display a shortcut menu.
3. From the shortcut menu, choose **Delete**. The command marker is removed from your project.

### Working with CD layout markers

Markers on the CD layout bar indicate the locations of tracks and indices in an audio CD layout project. These markers are discussed in a later chapter.

*For more information, see Understanding tracks and indices on page 387.*

### Working with the marker tool

You can use the marker tool to navigate the marker bars and edit multiple selected markers.

1. Click the **Marker Tool** button ( ) in the top-right corner of the timeline.
2. Select the markers you want to edit:
   - Press the Left Arrow/Right Arrow keys to move to the previous/next marker in the active bar (marker/region bar, CD layout bar, or command bar).
   - Press Shift+Left Arrow/Right Arrow keys to extend the selection to the previous/next marker.
   - Press Shift while clicking two marker tags to select all markers between the two tags.
   - Press Ctrl while clicking marker tags to select or deselect individual markers.
3. Edit your markers:
   - Dragging any selected marker will move all selected markers in the active bar as a group.
   - Pressing Delete will remove all selected markers in the active bar.

The marker tool is inactive when you change focus to another portion of the Vegas Pro window.

## Using an external audio editing program

Vegas Pro software is a nondestructive editing environment, which means that the original source files remain unchanged by any editing done in the software. Destructive (constructive) edits that modify the actual source media file can be done in a separate application such as Sound Forge® software from Sony Creative Software Inc. By setting up a separate audio editor, you can quickly access the program from Vegas Pro software via the **Tools** menu or by pressing Ctrl+E.

### Setting up an audio editing program

If you already have Sound Forge software loaded on your computer when you installed Vegas Pro software, the installation should have detected it and made it your default audio editing program. However, if you do not have Sound Forge software or want to specify a different audio editor, you can do so in the Preferences dialog.

1. From the **Options** menu, choose **Preferences**. The Preferences dialog appears.
2. In the Preferences dialog, click the **Audio** tab.
3. Click the **Browse** button to the right of the **Preferred audio editor** box. The Preferred Audio Editor dialog appears.
4. From this dialog, navigate to the application to use for editing audio files.
5. Select the application's executable icon (.exe) and click **Open** to set the application as your default audio editor.

   The application's path displays in the **Preferred audio editor** box.

### Opening an audio editor from Vegas Pro software

All events in your project are references to media files on a storage device. When you edit an audio event in an audio editor, you can choose to open the original media file or a copy of the file.

#### Opening a file in an audio editor

You can directly edit the media file to which an audio event is referenced. Any changes you make and save in the audio editor are permanent and are reflected in the event in your project.

1. Select the event to be edited.
2. From the **Tools** menu, choose **Audio**, and choose **Open in Audio Editor** from the submenu.

Your selected audio editing application opens the event's referenced media file. Make the necessary changes and save the file in the audio editor. If you keep the media file's name and location the same, its event is updated immediately in your project. However, if you change the media file's name or location (by using Save As), you must import the edited (new) file into Vegas Pro software.

#### Opening a copy of a file in an audio editor

You can also create a copy of an audio file and open it in an audio editor. Opening a copy of a file has the advantage of preserving the original file unchanged. The modified copy is inserted into the event as a take and is automatically added to the Project Media window.

1. Select the event to be edited.
2. From the **Tools** menu, choose **Audio**, and choose **Open Copy in Audio Editor** from the submenu.

When you are finished editing, save the file. "Take *X*" is added to the end of the file name to distinguish it from the original and adds it to the project as a take. If you save it to a new file (by using Save As), you must manually add it as a take into the project. *For more information, see Working with takes on page 105*.

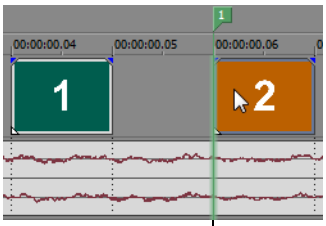
Chapter 4

# Advanced Editing Techniques

This chapter builds on the techniques that were introduced in the last chapter. Ripple editing, pitch shifting, and takes are just three of the more advanced editing topics that are covered in this chapter.

## Snapping events

Vegas® Pro software is preset to snap events into place as you drag them.




Events can snap to another event's edges, to the cursor position, a marker or region, the grid, or to a time selection. As you move an event along the timeline, its edge automatically aligns to designated snap points.

As you drag items along the timeline, an indicator is displayed to show snap points. When you snap to an event, the snap indicator is displayed in the appropriate track. If you snap to the cursor, a marker/region, time selection, or the grid, the snap indicator is displayed across the height of the timeline.

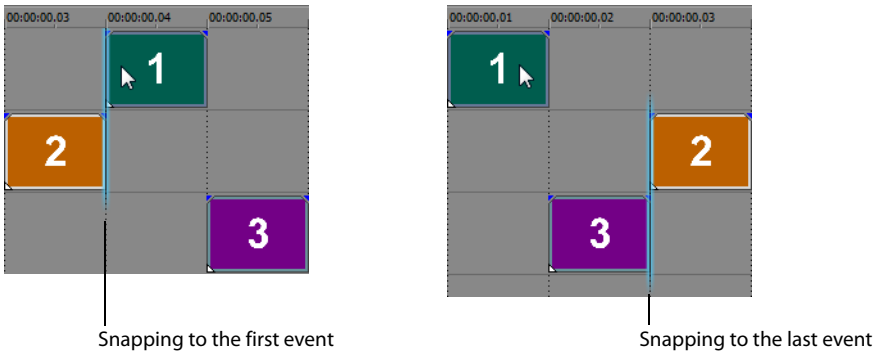
**Tips:**

- *Hold the Shift key to temporarily override snapping.*
- *You can edit snap indicator colors on the* **Display** *tab of the Preferences dialog. For more information, see* *Display tab on page 428*.

### Turning snapping on and off

You can quickly turn snapping on and off by clicking the **Enable Snapping** button ( ). You can also selectively turn snapping options on and off in the **Options** menu. When snapping is enabled, events will snap to the following points:

- Other events' edges
- The cursor
- Time selection edges
- First and last event edges, when dragging multiple events




You can also choose to snap events to grid lines or to markers.

### Snapping to the grid

When snapping is enabled, you can also choose to have elements in the timeline snap to the vertical grid lines in the timeline.

From the **Options** menu, choose **Snap to Grid** (or press Ctrl+F8) to toggle snapping to grid lines.

> **Tip:** *To change the spacing of the grid, choose* **Grid Spacing** *from the* **Options** *menu and choose a setting from the submenu.*

### Snapping to markers

When snapping is enabled, you can also choose to have elements in the timeline snap to markers in the timeline.

From the **Options** menu, choose **Snap to Markers** (or press Shift+F8) to toggle snapping for all marker types:

- Markers
- Regions
- CD track regions
- CD index markers
- Command markers

If the **Event Media Markers** command is selected on the **View** menu, you can also use media markers as snap points when you click in an event or edge-trim an event. *For more information, see Editing events on page 76.*

> **Note:** *If a media file's frame rate does not match your project frame rate, you will not be able to snap to media markers (or other snap points that do not occur on a frame boundary) when* **Quantize to Frames** *is selected on the* **Options** *menu.*

### Snapping to events on other tracks

When snapping is enabled, you can also choose to have elements in the timeline snap to the ends of events on other tracks.

From the **Options** menu, choose **Snap to All Events** (or press Ctrl+Shift+F8) to toggle snapping to event edges across tracks.

### Quantizing to frames

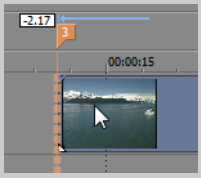
From the **Options** menu, choose **Quantize to Frames** to force edits to occur on project frame boundaries. This setting is independent of grid and marker snapping.

When **Quantize to Frames** is turned on, the following actions will always occur on frame boundaries:

- Positioning the cursor
- Making selections
- Placing markers and regions
- Moving video events

> **Note:** *If* **Quantize to Frames** *is on while dragging an audio event and the selection group contains video, the movement is quantized so the first video event is quantized (instead of the audio event).*
>
> *When performing audio-only edits, quantization will occur only if* **Quantize to Frames** *is turned on and the* **Do not quantize to frames for audio-only edits** *check box on the* **Editing** *tab of the Preferences window is not selected. For more information, see Editing tab on page 427.*

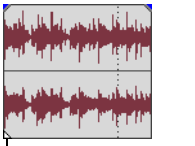
**Note:** *If you drag to a snap point that does not occur on a frame boundary when* **Quantize to Frames** *is enabled, the snap indicator is displayed as a dashed line to indicate that the snap point will be quantized to the nearest frame boundary:*

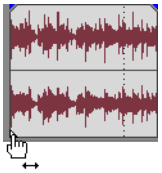



**Important:** *Edits that do not occur on frame boundaries can produce an undesirable visual result. For example if you split two events and move them together to create a cut, splits that are not at frame boundaries can produce a short dissolve in your rendered video.*

### Using the event snap offset

Each event in your project has a snap offset flag that can be moved along the length of the event. The flag is the white triangle that is located in the lower-left corner of each event. This flag allows you to designate where snapping occurs. This is useful if you need to align the snap with a beat in the event instead of the edge.

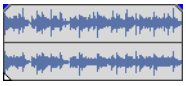


1. Place the mouse pointer on the snap offset triangle. The pointer changes to a hand icon ( ).
2. Drag the snap offset flag to the new position in the event. As the flag moves, a time display appears. This time display indicates where the snap offset flag occurs in time in the event.
3. Release the mouse to set the snap offset flag.

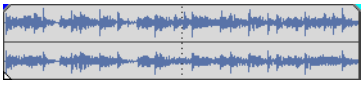
## Pitch shifting audio events

A pitch shift is a way to raise or lower the pitch of an audio event. The semitone range is -24 to 24. Twelve semitones equal one octave, so you can increase or decrease the pitch of an event within a two-octave range. Within each semitone is a finer pitch adjustment called cents. There are one hundred cents in one semitone.



Original event

Event with pitch shift of 12
or one octave speeds up



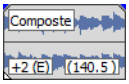
Event with pitch shift of -12
or one octave slows down

### Editing from the timeline

1. Select an event.
2. Use the = and - keys on your keyboard (not the numeric keypad) to adjust pitch:

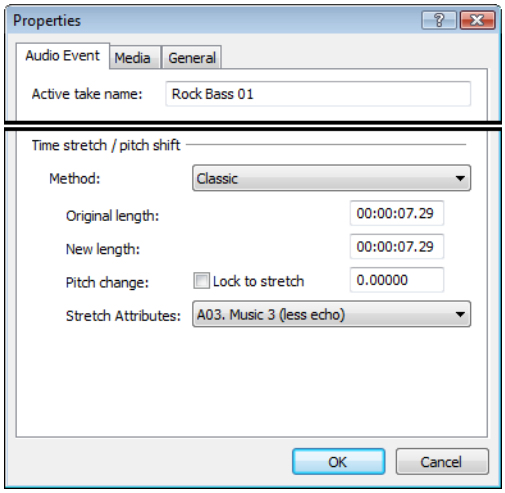
| Key | Result |
|---|---|
| = | Raise pitch one semitone. |
| Ctrl+= | Raise pitch one cent. |
| Shift+= | Raise pitch one octave. |
| Ctr+Shift+= | Reset pitch. |
| - | Lower pitch one semitone. |
| Ctrl+ - | Lower pitch one cent. |
| Shift+ - | Lower pitch one octave. |
| Ctr+Shift+ - | Reset pitch. |

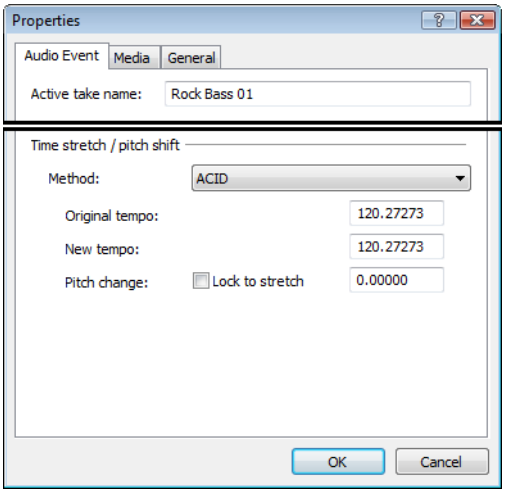
If the **Active Take Information** option is selected on the **View** menu, the event's pitch shift is displayed in the bottom-left corner of the event. If the media has a known root note, the new root is displayed in parentheses:




### Editing in the Event Properties dialog

1. Right-click the event and choose **Properties** from the shortcut menu.
2. On the **Audio Event** tab, choose a setting from the **Method** drop-down list to specify how you want to pitch-shift the event, or choose **None** if you want to preserve the event pitch.




3. If you selected **Classic** from the **Method** drop-down list, indicate the new event length and amount of pitch shifting you want to apply:
   a. Type the desired event length in the **New length** box.
   b. Type the desired pitch shift (in semitones) in the **Pitch change** box.

      If you want to change the event length without changing pitch, type 0 in the box.

      If you want the pitch to be determined by the amount of time stretching, select the **Lock to stretch** box. For example, doubling an event's length will raise its pitch by one octave.
   c. Choose a setting from the **Stretch Attributes** drop-down list to specify how you want to divide and crossfade the file to prevent artifacts. Depending on your source material, you might need to experiment with different crossfade types.

4. If you selected **ACID** from the **Method** drop-down list, indicate the new event tempo and the amount of pitch shifting you want to apply:
   a. Type the desired event length in the **New tempo** box.
   b. Type the desired pitch shift (in semitones) in the **Pitch change** box.

      If you want to change the event length without changing pitch, type 0 in the box.

      If you want the pitch to be determined by the new event tempo, select the **Lock to stretch** box. For example, doubling an event's tempo will raise its pitch by one octave.
5. Click **OK**.

## Time compressing/stretching events

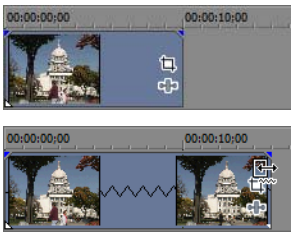
Time stretching and compressing events is the process of using the same amount of source media to fill a shorter or longer event. While this can be done to both video and audio events, the two cases are fundamentally different.

Press Ctrl and drag the edge of the event toward the center of the event to compress (shorten) it or drag the edge out away from the center to stretch (lengthen) it.

You can see the results of the time compression or stretching by viewing the properties of the event. Right-click the event and choose **Properties** from the shortcut menu. Time compressing/stretching an audio event affects the **Time stretch/pitch shift settings**, while Time compressing/stretching a video event affects the **Playback rate** setting.

**Tip:** *You can time compress/stretch several events at once by grouping them first. You can also apply a ripple edit after time compressing or stretching events. For more information, see* *Grouping events on page 188 or Applying post-edit ripples on page 87*.

Time stretching video allows you to fill a given duration with a set amount of actual video, sometimes called fit-to-fill. For example, if you have a five-second video event and you want this event to fill an eight-second slot, press Ctrl and drag the edge of the event to eight seconds. The resulting video is in slow motion, but the contents (footage) remain the same. If you had used a velocity envelope to slow the video to the same rate, the event would also be in slow motion, but its duration would remain unchanged at five seconds. Stretched video has a zigzag line between thumbnails. Video can also be compressed (sped up and shortened in length) by using this method.




When stretching video events or slowing video down, a set number of frames are extended across a period of time. For example, if you take source footage at 30 frames in a second and slow it so that only 15 source frames run during that same second, an additional 15 frames must be created to maintain the project's 30 fps frame rate. Simply duplicating frames is the easiest way to do this. A more sophisticated method is to resample the frames of an event, allowing Vegas Pro software to interpolate and redraw these intervening frames. *For more information, see* *Resample (video only) on page 181 and Resampling video on page 275*.

## Working with takes

A take is a version of a scene or audio recording, as in "Scene 10, Take 7", which means the seventh time that scene number ten has been shot. A number of takes can be included in the same location (event) of the project. You can then rapidly switch between these separate takes to see which one fits into the project the best. Although this is what takes are designed for, you can actually use any media files you want as a take, even completely different sounds or scenes. Since an event is just a container of a specific length and at a specific location, the actual content (media file) is easily changed.

**Tip:** *To slip all of an event's takes when slipping media, make sure* **Slip All Takes** *is selected in the* **Options** *menu.*

## Adding takes

You can add multiple media files to the timeline at the same time to a single event as takes. You can also add regions within media files as takes. *For more information, see Adding regions as takes on page 112.*

### Adding media files to the timeline as takes

1. Locate the media files that you want to insert as takes in the Explorer and select them. Select a range by pressing Shift and clicking the first and last file in the range, or select nonadjacent files by pressing Ctrl and clicking the various clips individually.
2. Right-click and drag one of the selected clips in the group to the timeline.
3. From the shortcut menu, choose **Add as Takes**.

**Tip:** *To add either just the audio or just the video portions of files as takes, choose* **Video Only: Add Video as Takes** *or* **Audio Only: Add Audio as Takes** *from the shortcut menu.*

### Adding takes to existing events

You can add media files to existing events as takes.

1. Right-click a media file in the Explorer and drag it to an existing event.
2. From the shortcut menu, choose **Add as Takes**.

## Selecting takes

When you add an event with multiple takes, a single event is inserted into a track. The length of the event is set according to the last clip that was selected. This last clip is set as the active take.

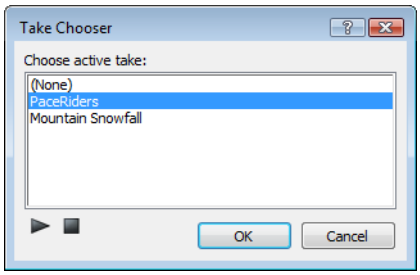
1. Right-click an event with multiple takes.
2. From the shortcut menu, choose **Take**, and choose **Next Take** or **Previous Take** from the submenu. Alternately, choose the name of the take from the list at the bottom of the submenu.

**Tip:** *Click an event and press T to select the next take or Shift+T to select the previous take.*

## Previewing and selecting takes

You can preview the takes for a given event.

1. Select an event containing multiple takes.
2. Right-click to display a shortcut menu or, from the **Edit** menu, choose **Take** to display a submenu.
3. Choose **Choose Active**... from the submenu. The Take Chooser dialog appears.




4. Select the take that you want to preview and use the **Play** ( ) and **Stop** ( ) buttons within the dialog.
5. To use a take, select it and click **OK**. The selected take is now the active take.

### Deleting takes

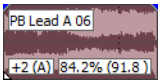
You can delete individual takes from an event at any time.

1. Right-click an event with multiple takes.
2. From the shortcut menu, choose **Take**, and choose **Delete Active** from the submenu to immediately remove the active take. Alternately, choose **Delete** to open a dialog with a list of all of the takes contained in this event.

### Displaying take information in events

From the **View** menu, choose **Active Take Information** to display the current take information on events in the timeline.

Pitch shifted audio events will display the amount of pitch shift in the bottom-left corner of the event. If the media has a known root note, the new root is displayed in parentheses:




Stretched audio events will display a percentage in the lower-right corner of the event to indicate the stretched playback rate. If the media has a known tempo, the effective playback tempo (after stretching) is listed in parentheses after the stretch amount.

Audio and video events that are not synchronized will be highlighted in the timeline, and the amount of offset will be displayed. Very small offsets that are below the resolution of the timeline might be displayed as 0.00. Set the project time format to samples to see the offset amount.

### Working with take names

#### Displaying take names on events

Take names can be displayed on the events in the timeline. From the **View** menu, choose the **Active Take Information** option.

Without take name

With take name

#### Changing take names

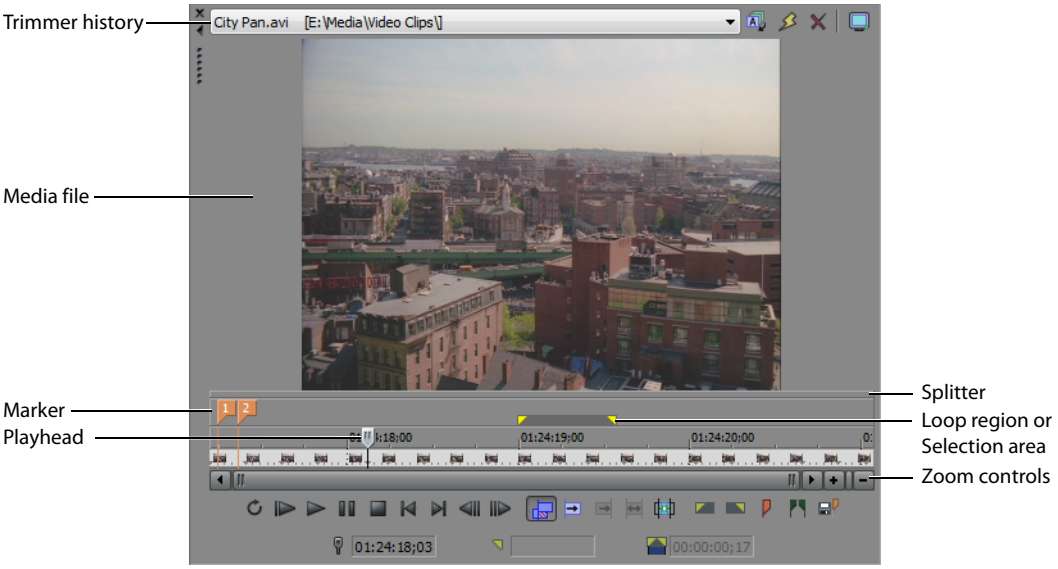
Changing the name of a take does not affect the source media file in any way. Typically, you might want to change an event's name after recording multiple takes into a track or event. *For more information, see Working with multiple recorded takes on page 244.*

1. Select the take to be renamed. *For more information, see Selecting takes on page 106.*
2. Right-click the event to display a shortcut menu.
3. From the shortcut menu, choose **Properties**. The Properties dialog opens.
4. Type the new name in the **Active take name** box.
5. Click **OK** to set the new take name.

## Using the Trimmer window

The Trimmer allows you to work with and edit one media file at a time. The entire file is opened into the Trimmer, in contrast to events on the timeline that might only contain a portion of the actual source file.

The main function of the Trimmer window is to allow you to trim a media file and place portions of it on a track. You can also add regions and markers to a file, preview the media file, or open it in an external audio editing program.




### Notes:

- *The ruler, scrollbar, and zoom controls may not be visible if there is not enough space to display them. Drag the horizontal splitter between the video monitor and the Trimmer timeline to adjust the height of the timeline.*
- *When the scrollbar is hidden, you cannot zoom in or out on the waveform.*
- *When the Trimmer window is too narrow to display all buttons on the toolbar, the hidden buttons can be found in the* **More Buttons** *drop-down list.*

| | |
|---|---|
| Sort Trimmer History | Next Frame |
| Clear Trimmer History | Enable Timeline Overwrite |
| Remove Current Media from Trimmer History | Add Media from Cursor |
| Trimmer on External Monitor | Add Media up to Cursor |
| Loop Playback | Fit to Fill |
| Play from Start | Create Subclip |
| Play | Set In Point |
| Pause | Set Out Point |
| Stop | Insert Marker |
| Go to Start | Insert Region |
| Go to End | Save Markers/Regions |
| Previous Frame | |

**Tip:** *Click and hold the* **Previous Frame** *and* **Next Frame** *buttons to move the cursor multiple frames.*

You can open any number of files in the Trimmer at the same time, selecting the one you currently want to work on from the **Trimmer history** drop-down list.

**Tips:**

- *If you open a multichannel audio file in the Trimmer, you can choose which channels you want to display in the Trimmer window. Right-click the waveform display, choose* **Channels** *from the shortcut menu, and then choose a command from the submenu.*
- *If you open a multistream audio file in the Trimmer, you can choose which stream you want to display in the Trimmer window. Right-click the waveform display, choose* **Stream** *from the shortcut menu, and then choose a stream from the submenu.*
- *If you want to edit in the Trimmer window without updating the Video Preview window, right-click the media file in the Trimmer window and clear the* **Show Video in Preview Window** *command.*

From the **View** menu, choose **Trimmer** or press Alt+2 to display the Trimmer window, if it is not already visible. You can dock the Trimmer window in the window docking area or float it over the work area. *For more information, see Window docking area and floating window docks on page 25.*

### Opening a file in the Trimmer

1. Right-click an event. A shortcut menu appears.
2. Choose **Open in Trimmer**.

You can also drag files to the Trimmer from the Explorer or the Project Media windows.

**Tip:** *If you want to open the original media file that was used to create a subclip in the Trimmer, right-click a subclip in the Project Media window and choose* **Open Parent Media in Trimmer** *from the shortcut menu.*

#### Double-clicking a file to open it in the Trimmer

You can set the software to open a file in the Trimmer when you double-click the file in the Project Media or Explorer windows.

1. From the **Options** menu, choose **Preferences**.
2. Click the **General** tab.
3. Choose **Double click on media file loads into Trimmer instead of tracks**.

### Choosing Trimmer preview options

When you're editing in the Trimmer, you can choose to display video in the Video Preview window or in a video monitor within the Trimmer.

- If you want to display the Trimmer cursor position in the Video Preview window, right-click the media file in the Trimmer window and verify **Show Video Monitor** is not selected. Right-click the media file again and select **Show Video in Preview Window**.

  When you click to position the cursor in the Trimmer window, the frame at the cursor position will be displayed in the Video Preview window, and the transport controls in the Trimmer window will play the current file in the Video Preview window.
- If you want to display a dedicated video monitor in the Trimmer window, right-click the media file in the Trimmer window and select **Show Video Monitor**. When the video monitor is on, you can right-click the media file in the Trimmer window and select **Show Video Frames** to toggle video frames in the Trimmer window.
- If you want to display the Trimmer cursor position on an external monitor, select the **Trimmer on External Monitor** button ( ).

**Tip:** *If an external monitor is enabled for the Trimmer and the Video Preview window, focus will determine which source is sent to the external monitor. Click in the Trimmer window to send its video to your external monitor. Click the timeline or track list to send its video to your external monitor.*

### Choosing multichannel/multistream options

When you're working with multichannel or multistream audio in the Trimmer, you can choose whether you want to add multichannel/multistream audio to the timeline when creating events.

Right-click the audio waveform in the Trimmer and select **Use All Streams and Channels** to allow Vegas Pro to determine which audio streams and channels to use:

- Multichannel audio from MXF files will be added to the timeline if the **Import MXF as multichannel** check box on the **General** tab of the Preferences dialog is selected. When the check box is cleared, audio from MXF files will be imported as stereo, but you can access the other channels by right-clicking the event and choosing **Channels** from the shortcut menu.
- When using surround AC3 or Windows Media, the stereo downmix stream will be used when adding media to a stereo project. When adding media to a 5.1 surround project, the stereo stream will be used.
- In other cases, all streams and all channels will be added to the timeline.

When **Use All Streams and Channels** is not selected, only the stream and channels displayed in the Trimmer will be added to the timeline.

### Moving frame by frame in the Trimmer window

As you navigate through a video file in the Trimmer, the exact frame that the cursor is over in time is displayed as in a thumbnail image under the cursor. When using the left and right arrow keys, this allows you to edit with frame accuracy.

You can also click the **Previous Frame** ( ) and **Next Frame** ( ) buttons to navigate frames in the Trimmer window.

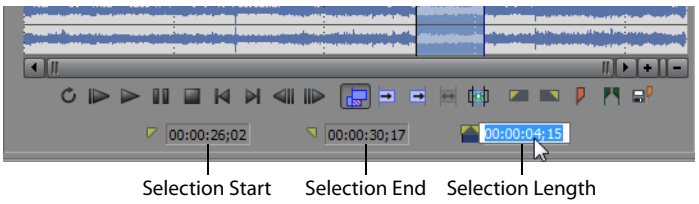
**Tip:** *Click and hold the* **Previous Frame** *and* **Next Frame** *buttons to move the cursor multiple frames.*

### Making selections in the Trimmer

After you have opened a media file in the Trimmer, you can select a segment of it and place it in your project. Make a time selection to select a segment in the Trimmer in the same way you do in the project timeline. *For more information, see* *Selecting a time range on page 73*.

You can make a selection during playback by using the keyboard. Press I or [ to mark the start of the selection, and press O or ] to mark the end.

If you know the exact timecode of the point where you want to begin and end a time selection, you can type it into the boxes at the lower right corner of the Trimmer window.




Double-click to type a value.

**Tip:** *Press Backspace to recall the last five time selection areas in the Trimmer.*

### Adding selections to the timeline

You can use the Trimmer window to do traditional two-point, three-point and four-point editing. These editing techniques allow you to add smaller sections of files to the timeline.

Post-edit ripple mode affects how a selection is added to the timeline from the Trimmer. When the **Auto Ripple** button ( ) is selected, adding a selection from the Trimmer selection affects the position of later events on the track. When not in post-edit ripple mode, adding a selection from the Trimmer has no effect on the position of other events. *For more information, see* *Editing events on page 76*.

### Adding selections at the cursor (three-point editing)

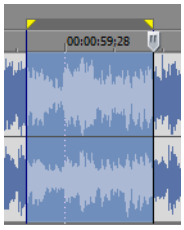
1. Open a media file in the Trimmer.
2. Make a time selection in the Trimmer.
3. Select the track in the timeline where the selection will be added.

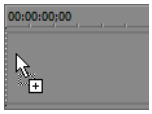
> **Tip:** *You can also select two points in the timeline and a single point in the Trimmer to perform three-point editing. In this mode, ripple editing is not applied. For more information, see* *Applying post-edit ripples on page 87*.

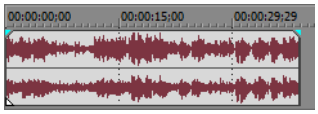
4. Position the cursor in the timeline at either the start or end point where you want to add the selection.
5. Add the selection to the timeline in one of the following ways:
   - Click the **Add Media from Cursor** button ( ) or press A to insert the event after the cursor.
   - Click the **Add Media up to Cursor** button ( ) or press Shift+A to insert the event before the cursor.

   Alternately, you can drag the selection from the Trimmer to the timeline.

   Drag from the Trimmer to a project track.








### Using a Trimmer selection to fill a timeline selection (four-point editing)

1. Open a media file in the Trimmer.
2. Select the portion of the file that you want to use.
3. Select the portion of the timeline where you want to use the Trimmer selection.
4. Click the **Fit to Fill** button ( ). The Trimmer selection is time-compressed or stretched to fill the timeline selection.

### Overwriting timeline events with the Trimmer selection

The standard behavior of the Trimmer is to perform punch-in edits on the timeline: when you add media to the timeline, the events created by the Trimmer are laid over existing events on the timeline. You can delete or move the events you create with the Trimmer without changing the underlying events.

If you want to replace the contents of the timeline when creating events from the Trimmer, select the **Enable Timeline Overwrite** button ( ). When **Enable Timeline Overwrite** is selected, ripple editing is not available. *For more information, see* *Applying post-edit ripples on page 87*.

## Using the Trimmer History list

The drop-down list at the top of the Trimmer lists files and events that have been opened in the Trimmer.

To open a recently used file, choose its file name from the Trimmer History drop-down list.

To sort the list, click the **Sort Trimmer History** button ( ). The files in the drop-down list are sorted in alphabetical order. To sort in reverse alphabetical order, hold the Ctrl key while clicking on the **Sort Trimmer History** button.

> **Tip:** *By default, the Trimmer History list displays file name followed by file path. You can choose to display file path first by clearing the* **Show trimmer history with file name first, then folder** *check box on the* **General** *tab of the Preferences dialog. For more information, see* *General tab on page 413*.

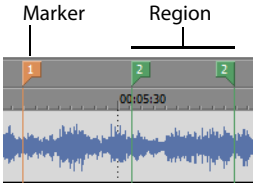
To clear the list, click the **Clear Trimmer History** button ( ). All files in the drop-down list are removed.

To remove a single file from the list, click the **Remove Current Media from Trimmer History** button ( ). The media file is removed from the drop-down list and the Trimmer window is blank.

## Adding and saving regions and markers to a media file

The Trimmer allows you to add markers and regions to a media file in the same way that you add them to your project. You can also click the **Insert Marker** ( ) and **Insert Region** ( ) buttons in the Trimmer window to add markers and regions.

Media file markers and regions are different from project markers and regions. The difference between the two is that project markers and regions affect a project, while media file markers and regions are embedded in, and saved with, a media file.




The markers and regions you add in the Trimmer are only temporary. You must save them by clicking the **Save Markers/Regions** button ( ) in the Trimmer window if you want to use them again after you close the project. After the markers and regions are added and saved to the media file, they are available when you open the media file in an audio editor program or in the Trimmer.

**Note:** *You cannot save markers to read-only media files. Change a file's properties to make the file writable before saving markers.*

### Automatically saving Trimmer markers and regions with media files

1. From the **Options** menu, choose **Preferences.**
2. On the **General** tab, select **Automatically save trimmer markers and regions with media file**.

### Adding regions as takes

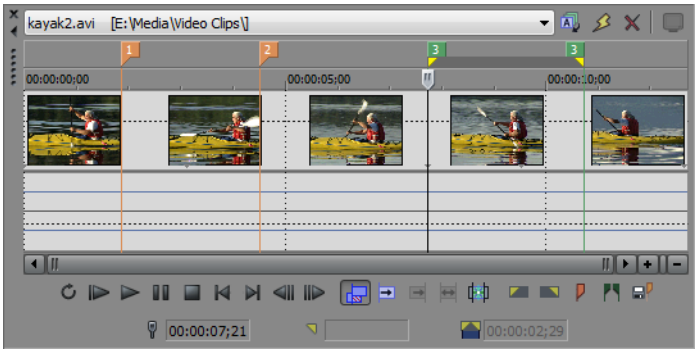
Once regions are saved with a media file, either in the Trimmer window or in another application, you can add the regions as takes to the timeline from the Explorer window. In the Explorer window, click the arrow next to the **View** button and select **Region View** from the drop-down list. A single media file can contain a number of separate regions. You can select these regions individually or as groups and insert them as takes into the timeline. This is especially useful when loop-recording numerous takes to a single file.
*For more information, see Working with takes on page 105.*

### Viewing media markers and regions in events

From the **View** menu, choose **Event Media Markers** to toggle the display markers (including XDCAM essence marks) and regions that are saved in a media file. These markers are displayed in the timeline in events that refer to the media file.

Media markers and regions cannot be edited within the event. However, when you edit the markers in markers and regions in the Trimmer window or in an external audio editor, the event will reflect your changes.

Media markers in Trimmer




Media markers in event

**Tips:**

- *From the* **View** *menu, choose* **Event Media Markers**, *and then choose* **Show Marker Labels** *from the submenu to toggle the display of marker labels in events.*
- *When media markers are displayed, you can use them as snap points for positioning the cursor and for edge-trimming if* **Snap to Markers** *is selected on the* **Options** *menu. If a media file's frame rate does not match your project frame rate, frame quantization will occur after the snap if* **Quantize to Frames** *is selected on the* **Options** *menu.*

## Opening a file in an external audio editor from the Trimmer

The Trimmer allows you to open your selected audio editing application (for example, Sound Forge) to perform permanent edits to the media file. After you make the necessary changes and save the file in the audio editor, the event is automatically updated. Make sure that the media file's name and location remain the same. *For more information, see* *Using an external audio editing program on page 100*.

To open the audio editor from the Trimmer, right-click the audio waveform and select **Open in Audio Editor**.

## Using subclips

### Creating a subclip

1. Create a selection in the Trimmer window.
2. Click the **Create Subclip** button ( ). The **Create Subclip** dialog appears.

**Tip:** *You can also right-click an event in the timeline and choose* **Create Subclip** *from the shortcut menu.*

3. In the **Name** box, type the name you want to use to identify the subclip in the Project Media window. By default, the file name is used with a subclip number appended.
4. Select the **Reverse** check box if you want the subclip to be played backward when you add it to your project.
5. Click **OK** to create the subclip. You can then create events from subclip via the Project Media window.

#### Selecting a subclip in its parent media

1. Right-click a subclip in the Project Media window and choose **Open in Trimmer** from the shortcut menu.
2. Right-click the media file in the Trimmer window and choose **Select Parent Media** from the shortcut menu. The subclip's original media file is opened in the Trimmer, and the portion of the media that represents the subclip is selected.

> **Tip:** *If you want to open the original media file that was used to create the subclip in the Trimmer, right-click an event on the timeline (or a subclip in the Project Media window) and choose* **Open Parent Media in Trimmer** *from the shortcut menu.*

#### Opening files in the Trimmer by default

You can automatically load files into the Trimmer window by selecting the **Double-click on media file loads into Trimmer instead of tracks** check box on the **General** tab in the Preferences dialog. *For more information, see General tab on page 413.*

When this check box is selected, no events are created when you double-click a media file in the Explorer window or Project Media window. Instead, the Trimmer is displayed to allow you to choose a portion of the file you want to use.

## Removing red eye from still images

1. Right-click a still image on the timeline (or in the Project Media window) and choose **Red Eye Reduction** from the shortcut menu.
2. Click the center of the red eye and drag to create a selection around the red portion of the eye.
3. Click the **Zoom In** (+) and **Zoom Out** (–) buttons to change the magnification of the image, or roll the mouse wheel forward or backward to zoom around the cursor position.

> **Tip:** *For keyboard shortcuts to help you navigate in the Red Eye Reduction window, see Red eye reduction commands on page 479.*

4. Drag to position the selection box over the portion of the eye you want to correct.
5. Drag the borders of the selection box to adjust its size. Vegas Pro automatically adjusts the portion of the image in the selection box to remove red eye.

> **Tip:** *Right-click a selection box and choose* **Delete** *from the shortcut menu to remove it.*

6. Readjust the selection box as needed, and repeat this procedure for each red eye in the image.

> **Note:** *If an image is used multiple times in your project, removing the red eyes once will affect all instances of the image.*

## Using the Edit Details window

The Edit Details window displays a database for all of the media in your project. It shows information about how the files are being used and allows you to modify many of those properties. You can sort, add or change information, rearrange columns, and edit items in the project.

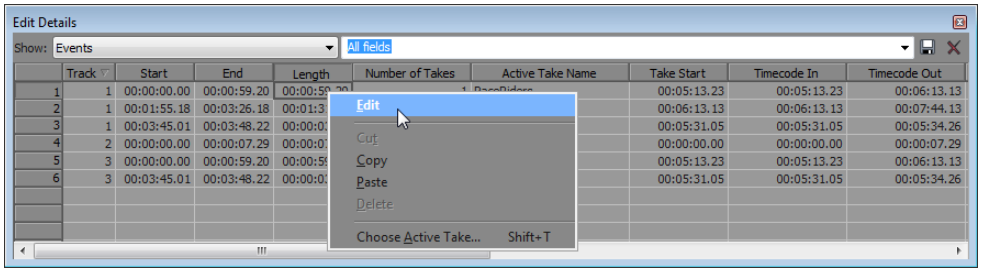
This window provides an alternate method for working with events, audio CD track list items, command markers, markers, and regions after they are placed in your project.

You can dock the Edit Details window in the window docking area or float it on the workspace. *For more information, see Window docking area and floating window docks on page 25.*

## Viewing the Edit Details window

To view the Edit Details window, choose **Edit Details** from the **View** menu or press Alt+4. The **Show** drop-down list allows you to view categorized project information. You can edit most entries by double-clicking them or by right-clicking them to display a shortcut menu.

Right-click an entry to display a shortcut menu, or double-click an entry to edit it.




Use the scroll bar to view other columns in the window.

### Audio CD track list

The **Audio CD track list** category displays information about the track and index markers placed on the CD layout bar. This information is used to burn audio CDs. *For more information, see Understanding tracks and indices on page 387.*

### Commands

The **Commands** category displays information about commands that are placed along the project's timeline. This category displays four columns: the command's position along the timeline, the command type, its parameters, and any comments that were entered when the command marker was placed in your project. Right-click a command entry to display a shortcut menu. *For more information, see Working with command markers on page 96.*

### Events

The **Events** category displays information about all of the events in your project. You can sort any of the information by clicking a column's header. The number of columns in the **Events** category requires that you use the scroll bar to view them all.

The following table explains each column in the **Events** category and describes its function.

| Column | Description | Edit function |
|---|---|---|
| Track | Displays the track number where the event is located. | Move the event to a different location by entering a different track number. *For more information, see Moving an event on page 62.* |
| Start | Displays when on the timeline the event starts playback. | Enter a different value to cause the event to begin playback sooner or later in the project. *For more information, see Moving events along the timeline on page 62.* |
| End | Displays when on the timeline the event ends playback. | Enter a different value to cause the event to end playback sooner or later in the project. *For more information, see Moving events along the timeline on page 62.* |
| Length | Displays the total length of the event. | Enter a different value to increase or decrease the event's playback time. |
| Number of Takes | Displays the amount of recorded takes contained in the event. | Display only (cannot be edited). |
| Active Take Name | Displays the event's current take name. | Enter a different name for the current take. *For more information, see Changing take names on page 107.* |
| Take Start | Displays the offset into the source media file when the placed event begins playback. | Enter a different value to cause the take to playback sooner or later from the source media file. |
| Timecode In | Displays the media file timecode at the start of the event. | Display only (cannot be edited). |
| Timecode Out | Displays the media file timecode at the end of the event. | Display only (cannot be edited). |

| Column | Description | Edit function |
|---|---|---|
| File Path | Displays the path of the event's media file. | Enter a new media file reference path for the event to use. |
| Tape Name | Displays the name of the source media tape name. | Change the tape name here or in the properties dialog for the media file. *For more information, see Modifying media file properties on page 284.* |
| Select | Displays whether the event is selected in the project. | Toggle the event's selection by clicking the check box. A check mark in the box indicates that the event is selected. *For more information, see Making selections on page 72.* |
| Mute | Displays whether the event is muted. | Toggle the event's mute switch by clicking the check box. A check mark in the box indicates that the event is muted. *For more information, see Mute on page 179.* |
| Loop | Displays whether the event is looped for playback. | Toggle the event's loop switch by clicking the check box. A check mark in the box indicates that the event is looped for playback. *For more information, see Loop on page 179.* |
| Lock | Displays whether the event is locked. | Toggle the event's lock switch by clicking the check box. A check mark in the box indicates that the event is locked. *For more information, see Lock on page 179.* |
| Normalize | Displays whether the event is normalized. | Toggle the event's normalize switch by clicking the check box. A check mark in the box indicates that the event is normalized. *For more information, see Normalize (audio only) on page 180.* |
| Snap Offset | Displays when in the event the snap offset is positioned. | Enter a different value to change the snap offset position in the event. *For more information, see Using the event snap offset on page 103.* |

#### Markers

The **Markers** category displays information about markers on the project's timeline. This category displays two columns: the marker's position on the timeline and the marker's name.

#### Regions

The **Regions** category displays information about regions on the project's timeline. This category displays four columns: the region's start position, end position, length, and name.

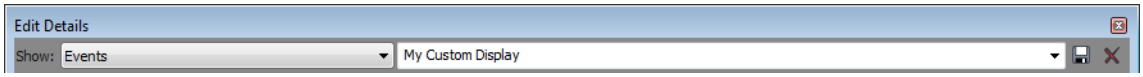
#### Selected Events

The **Selected Events** category is visually identical to the **Events** category except that the Edit Details window only displays information about events that are selected in your project.

### Customizing the Edit Details window

You can arrange and delete columns from each category and save the changes to a personal template. One template is available from which you can create your own display options.

1. From the **Show** drop-down list, choose the category that you want to customize.
2. Drag a column's header to the new position. The cursor changes to a column icon ( ) as you move the column. If you want to remove the column from the display, drag the icon off the Edit Details window. Release the mouse to drop the column in its new position.
3. The **Template** drop-down name changes to "Untitled." Type a new name in the **Template** drop-down.




4. Click the **Save** button ( ) on the Edit Details window to save the custom display.

**Tip:** *You can delete a custom display by selecting it from the template drop-down list and clicking the* **Delete** *button ( ).*

Chapter 5

# Working with Multicamera Video

Vegas® Pro makes it easy to work with video from multiple cameras right from the timeline. You can capture and edit video for a single scene from multiple cameras or for a single scene shot multiple times from one camera. Multicamera work is generally completed in the following steps:

1. Shooting video
2. Capturing video from cameras
3. Synchronizing video
4. Creating multicamera events
5. Editing multicamera video

The following sections cover information and tips for each step in the process.

## Shooting multicamera video

When shooting multicamera video, there are a few key components to consider before getting started:

- If possible, use the same make and model of camera and the same settings. Otherwise, you might need to do significant color correction in order to match the appearance between cameras.
- If possible, provide a single timecode source to all cameras.

  With synchronized timecode, Vegas Pro can lay out multicamera media in perfect synchronization. Otherwise, you'll need to manually adjust the alignment between clips.

  Unsynchronized timecode between two cameras—even of the same type—drifts as much as a second per hour. Likewise, date/time stamps also drift and can only be used for approximate layout. If you only need two cameras on your shoot, be aware that some Sony cameras (for example, HVR-V1) can synchronize timecode (using a feature called "TC Link") over i.LINK®.
- Set the date and time in each camera. The closer these are, the better the approximate layout will be. Even if you're using a master timecode source, you should set the date/time as a backup.

  Before or after each scene, record a synchronization point. It is preferable to use a video slate board for this purpose, but you can also employ a loud and visible hand clap. You can also use a flash from a still camera, but you must disable any red-eye reduction, as this can cause multiple flashes. A fast camera flash combined with a fast shutter speed can be problematic as well.

  Regardless of the synchronization method you choose, it must be visible by all cameras.

  If you forget to record a synchronization point, you'll have to align the clips in Vegas Pro using another reference point, such as something consistent in the audio or video. Be aware that in distant shots, the audio captured by the camera's microphone will be delayed from the video (1 frame for every 11.5 meters).
- At least one of the cameras should be recording the audio you'll use for the final edit. Alternatively, if you're using dual-system sound, you can record audio on another device altogether. If you are shooting a musical performance, you might even be using the studio-recorded audio track. If you record audio on multiple cameras, you'll be able to switch between it along with the video if you choose.

## Capturing multicamera video

You can use the Video Capture application included with Vegas Pro to capture recordings from each camera in your multicamera shoot just as you would normally. *For more information, see Capturing video on page 54.*

However, when you capture multicamera video, it is especially important to give each tape (or disc) a unique name; Vegas Pro uses this information to create a track for each camera. Before you begin the capture process, enable scene detection in the capture application so each segment becomes a separate clip. For more information on enabling scene detection in the Video Capture application, see the Vegas Pro online help.

## Synchronizing multicamera video clips

In order to effectively edit multicamera footage within Vegas Pro, you must have your video clips synchronized. The best place to do this is the timeline, using the same Vegas Pro editing tools as you would for any video project.

1. Start a new project or open an existing project to which you want to add the multicamera video. *For more information, see Starting a new project on page 37.*
2. From the **Options** menu, choose **Quantize to Frames** if it is not already selected. *For more information, see Quantizing to frames on page 102.*
3. From the **Options** menu, choose **Ignore Event Grouping** to turn it off. *For more information, see Suspending grouping temporarily on page 189.*
4. Select your clips in the Project Media window. *For more information, see Using the Project Media window on page 42.*
5. Add your clips to the timeline:
   - For clips with synchronized timecode, choose **Multicamera** from the **Tools** menu, and then choose **Lay Out Tracks Using Media Timecode** from the submenu.
   - For clips without synchronized timecode, choose **Multicamera** from the **Tools** menu, and then choose **Lay Out Tracks Using Media Date/Time Stamp** from the submenu.

   The result is a pair of tracks for each camera, with events aligned based on the timecode or date/time stamp of each clip. If your scenes were captured with synchronized timecode, your clips should be in perfect alignment. Otherwise, you'll need to adjust the alignment to synchronize the clips. The goal is to align the clips in time so the synchronization points you recorded occur at the same timeline position for all clips.

### Adjusting alignment using audio waveforms

If you used a slate or a loud clap for your synchronization point, you can align the events to within a frame of each other using the audio waveforms.

1. Use the zoom controls ( ) at the bottom-right corner of the timeline to zoom in on the waveform.
2. Drag a track's border to make the tracks taller and view large waveforms.
3. Use Shift+Up Arrow to magnify the waveforms if necessary.
4. Click the event and press 1 or 3 on the numeric keypad to nudge the event by frames to the left or right, respectively.

### Adjusting alignment using video

You can also align your events using the video.

**Note:** *These steps require snapping to be enabled, so if you have not already done so, turn snapping on by clicking the* **Enable Snapping** *button ( ). For more information, see Snapping events on page 101.*

1. Solo the video track.
2. Position the cursor at the synchronization point and drag over the event's snap offset so it snaps to the cursor. *For more information, see Using the event snap offset on page 103.*
3. Repeat these steps for each clip.
4. Drag the cursor to a snap point, and then snap the other clips to the cursor.

## Creating multicamera events

Vegas Pro uses takes for multicamera editing. While the multicamera editing feature can be used with any multitake video event, Vegas Pro makes it easy to build multitake events for multicamera editing.

*For more information on the takes feature in Vegas Pro, see Working with takes on page 105.*

1. When Vegas Pro creates multitake events from your camera tracks, the take order will match the track order. As a result, it's a good idea to first reorder your tracks if you have a particular order you prefer (wide shot, medium shots, handheld).
2. Once all of your cameras are laid out across tracks, synchronized, and ordered to your satisfaction, select the tracks from which you want to create a multicamera track (or press Ctrl+A to select all tracks).
3. From the **Tools** menu, choose **Multicamera**, and choose **Create Multicamera Track** from the submenu. Vegas Pro builds a set of tracks containing a series of events, with takes representing each of the cameras. Vegas Pro creates a new event for each time a camera was started and stopped, as well as empty "(no camera)" takes for video events where cameras were missing.

**Important:** *If you have envelopes, effects, or motion applied to the original camera tracks, these will be lost during this operation.*

## Editing multicamera video

Once you have synchronized multitake events, you can use multicamera editing mode to choose takes and switch cameras. This can be done while Vegas Pro is paused for cuts at precise points (such as certain timecodes or beat markers), or it can be done live during playback. Playback continues even when a take is chosen.

**Tip:** *When multicamera editing mode is active, video envelopes, effects, and motion are bypassed in the Video Preview window to preserve your playback frame rate.*

### Enabling multicamera editing mode

To edit multicamera video in Vegas Pro, you must enable the multicamera editing mode. From the **Tools** menu, choose **Multicamera**, and choose **Enable Multicamera Editing** from the submenu.

### Previewing multiple takes

In multicamera editing mode, the Video Preview window switches into multicamera mode, with a multicamera tiled view showing the contents of all takes simultaneously. The active take is highlighted with a colored border.

The active take is indicated by a colored border.

Camera or take name and number is displayed by default.

**Notes:**

- *Vegas Pro software can preview many takes at once in multicamera mode, but your computer performance will limit the playback frame rate.*
- *If you have multiple video tracks and/or overlapping video events, the topmost multitake event is displayed in the Video Preview window. Single-take events, such as title overlays, are ignored. When there are multiple video tracks, the topmost event is the one on the topmost track. When there are overlapping events on the same track, the topmost event is the one to the right.*

#### Toggling the display of camera/take name and number information in the Video Preview window

The camera and take name and number information display in the Video Preview window by default. You can toggle the display of this information from the **Video** tab of the Preferences window.

**Tip:** *You can also toggle the display of take names on events in the timeline. From the* **View** *menu, choose* **Active Take Information**.

1. From the **Options** menu, choose **Preferences**, and click the **Video** tab.
2. To turn off display of take name information, clear the **Display take names** check box. To turn off display of take number information, clear the **Display take numbers** check box.

#### Setting the active take indicator color

You can select the color that borders the active take in the Video Preview window.

1. From the **Options** menu, choose **Preferences**, and click the **Video** tab.
2. Click the **Active take indicator** color swatch to display a color picker, where you can choose any color using the RGBA or HSLA controls. Click the **Change Color Space** button ( ) to switch between RGB and HSL color modes, or click the **Pick Color from Screen** button ( ) to sample a color from your screen. Click **OK** to return to the **Video** tab, and then click **OK** to save your preference changes.

#### Previewing the full frame on an external monitor

You can choose to preview the full frame on an external monitor while in multicamera mode. This allows you to see the final output without leaving multicamera mode.

From the **Tools** menu, choose **Multicamera**, and then choose **Show Full Frame in External Monitor** to toggle this option on or off.

*For more information about previewing video on an external monitor, see Using an external monitor on page 356.*

### Choosing takes

There are several methods you can use for choosing takes, such as pressing number or numeric keypad keys or by clicking the takes in the Video Preview window. When you choose a take, Vegas Pro switches the active take for the multicamera event.

**Note:** *Holding the Ctrl key while calling a take will create a crossfade instead of a cut, with the alignment and duration determined by the* **Cut-to-overlap conversion** *settings (***Amount** *and* **Alignment***) in the* **Editing** *tab of the Preferences window. For more information, see Editing tab on page 427.*

In the Video Preview window, camera changes are displayed as the active take indicator moving across takes. When multicamera mode is off, you'll see camera changes in the video output.

To change takes, Vegas Pro splits the event at the call point and switches the active take.

**Note:** *Empty takes (those marked with "(no camera)") cannot be chosen.*

### Recutting sections

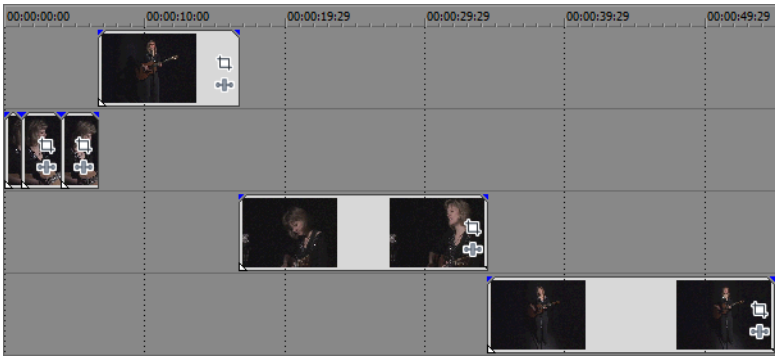
You can change the take used for an entire time selection. When possible, events using the same take are merged. If a take is not available for part of the time selection, those events are unchanged.

## Expanding a multicamera track to multiple tracks

Vegas Pro software can expand a multicamera track to multiple component tracks.

1. Select a multicamera track in the track list.
2. From the **Tools** menu, choose **Multicamera**, and choose **Expand to Multiple Tracks** from the submenu.
3. You are prompted to either keep unused takes as muted events or delete them. If you keep unused takes as muted events, you can recreate your multicamera track later. Click **Yes** to keep unused takes or **No** to delete them.

Expanded multicamera track with unused takes kept as muted events.




Expanded multicamera track with deleted unused takes.

## Turning off multicamera editing mode

From the **Tools** menu, choose **Multicamera**, and choose **Enable Multicamera Editing** from the submenu to turn off multicamera editing mode once you have completed your multicamera editing. In normal editing mode, the output displays only the active take for each event. If necessary, use traditional Vegas Pro editing tools to refine the edit. You can re-enable the multicamera editing mode and do further take selection at any time.

Chapter 6

# Stereoscopic 3D Editing

You can use Vegas® Pro to edit stereoscopic 3D (S3D) projects without any add-ons or additional tools.

Editing a stereoscopic 3D project is just like editing a standard Vegas Pro project and requires minimal adjustment to your workflow:

1. Start a new project and set your project properties to choose a stereoscopic 3D mode. *For more information, see Creating projects on page 37 and Setting up your stereoscopic 3D project on page 123.*
2. Set up your Video Preview window and external monitor (optional). *For more information, see Setting up stereoscopic 3D previews on page 126.*
3. Add media to the timeline. *For more information, see Adding media to the timeline on page 51.*
4. Synchronize and pair events on the timeline (when working with separate left and right video streams) or set stereoscopic 3D media properties if necessary. *For more information, see Synchronizing stereoscopic 3D events on the timeline on page 126.*
5. Align the left- and right-eye views and adjust video depth. *For more information, see Aligning left- and right-eye views and adjusting depth on page 128.*
6. Render your project. *For more information, see Rendering a stereoscopic 3D project on page 129.*

## Setting up your stereoscopic 3D project

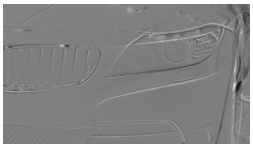
The **Video** tab in the Project Properties dialog allows you to configure options for working in 3D.

By default, the project's **Stereoscopic 3D mode**, **Swap Left/Right**, and crosstalk cancellation settings will also be used when previewing and rendering your project, but you can override the project settings if necessary.

1. From the **File** menu, choose **Properties**. The Project Properties dialog is displayed.
2. Choose a setting from the **Stereoscopic 3D mode** drop-down list.

| Setting | Description |
|---|---|
| **Off** | Choose this setting when creating a 2D project. |
| **Side by side (half)** | Choose this setting when your project will contain left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed as half of the available horizontal resolution.<br>In this example, the left-eye image is tinted blue, and the right-eye image is tinted red:<br> |
| **Side by side (full)** | Choose this setting when your project will contain left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed using the full horizontal resolution.<br>In this example, the left-eye image is tinted blue, and the right-eye image is tinted red:<br> |

| Setting | Description |
|---|---|
| **Top/bottom (half)** | Choose this setting when your project will contain left- and right-eye views stacked in a single frame.<br>Left- and right-eye views are displayed as half of the available vertical resolution.<br>In this example, the left-eye image is tinted blue, and the right-eye image is tinted red:<br> |
| **Top/bottom (full)** | Choose this setting when your project will contain left- and right-eye views stacked in a single frame.<br>Left- and right-eye views are displayed using the full vertical resolution.<br>In this example, the left-eye image is tinted blue, and the right-eye image is tinted red:<br> |
| **Anaglyphic (red/cyan)**<br>**Anaglyphic (amber/blue)**<br>**Anaglyphic (green/magenta)** | Choose an anaglyphic setting when your project will contain left- and right-eye views in a single frame.<br> |
| **Line alternate** | Choose this setting when your project will be displayed on a line-alternate 3D monitor.<br>Left- and right-eye views are interlaced using half of the available vertical resolution.<br>In this example, the left-eye image is tinted blue, and the right-eye image is tinted red:<br> |
| **Checkerboard** | Choose this setting when your project will be displayed on a DLP-based 3D monitor.<br>Left- and right-eye views are tiled using half of the available horizontal and vertical resolution.<br>In this example, the left-eye image is tinted blue, and the right-eye image is tinted red:<br> |

| Setting | Description |
| --- | --- |
| **Left only**<br>**Right only** | Choose the **Left only** or **Right only** setting for editing on a 2D monitor or if you're creating separate projects for the left- and right-eye outputs.<br>In this example, the left-eye image is tinted blue, and the right-eye image is tinted red:<br> |
| **Blend** | Choose this setting to blend the left- and right-eye images. This setting is useful when adjusting events.<br> |
| **Difference** | Choose this setting when performing vertical adjustments to minimize vertical disparity.<br>  |

3. Select the **Swap Left/Right** check box if you need to switch the left- and right-eye pictures. This setting is useful if you're using a line-alternate display that displays the right eye on top, if you're using magenta/green anaglyphic glasses, or to create cross-eye free-view 3D.
4. Drag the **Crosstalk cancellation** slider if you experience image bleed-through. For example, if you see right-eye images in your left eye, you can adjust the **Crosstalk cancellation** slider to compensate.

   When your project's **Stereoscopic 3D mode** is set to **Side by side**, **Top/bottom**, **Line alternate**, or **Checkerboard** mode, crosstalk cancellation is active only when the **Full-resolution rendering quality** drop-down list is set to **Good** or **Best**. When using anaglyphic modes, crosstalk cancellation is active for any quality level.
5. Select the **Include cancellation in renders and print to tape** check box if you want to use the **Crosstalk cancellation** setting in your final rendered output. Clear the check box if you want to use crosstalk cancellation for previewing only.

## Setting up stereoscopic 3D previews

You can use the Video tab in the Preferences dialog to choose the stereoscopic 3D format that will be used to view your 3D project in the Video Preview window. For example, you could choose **Anaglyphic (red/cyan)** from the **Stereoscopic 3D mode** drop-down list to preview your project using anaglyphic 3D glasses.

If you want to preview your project on a 3D television or monitor, you can use the Preview Device tab in the Preferences dialog to configure a 3D display for previewing your project.

- If you're using an NVIDIA graphics card that supports 3D Vision technology and a 3D Vision monitor, choose the **Windows Graphics Card** setting from the **Device** drop-down list in the Preview Device tab and choose **Left and Right** from the **Stereoscopic 3D mode** drop-down list.
- If you're using an NVIDIA graphics card that supports 3D Vision technology and a 3D-capable HDTV, choose the **Windows Graphics Card** setting from the **Device** drop-down list in the Preview Device tab and use the **Stereoscopic 3D mode** drop-down list to choose the method your monitor uses to display stereoscopic 3D content — typically **Side by side (half)** or **Line alternate**. Be sure to set the 3D mode in your television's setup menu and the Vegas Pro Preview Device tab.
- If you're using a 3D television connected to your computer via a IEEE 1394 (FireWire) connection, choose the **OHCI Compliant IEEE 1394/DV** setting from the **Device** drop-down list in the Preview Device tab and use the **Stereoscopic 3D mode** drop-down list to choose the method your television uses to display stereoscopic 3D content.

During playback, select the **Video Preview on External Monitor** button ( ) in the Video Preview window to enable your 3D display. You can turn off external preview by pressing Alt+Shift+4 or by clicking the secondary display and pressing Esc.

*For more information about setting up your specific hardware, see Preview Device tab on page 417.*

## Synchronizing stereoscopic 3D events on the timeline

When shooting stereoscopic 3D using a pair of cameras, it is important to record a synchronizing event. Some users clap or snap their fingers in front of the cameras; others use a flash from a still camera, a pet-training clicker, or a professional slate.

**Tips:**

- *If you're working with multistream 3D files or files that contain both images in each frame, you don't need to align events. When you add multistream media to a stereoscopic 3D project, the first stream will be used and paired with the next stream.*

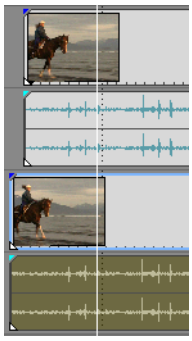
  *If you need to change the mode for a media file or swap the left/right images, you can use the* **Media** *tab of the Media Properties dialog. For more information, see Modifying media file properties on page 284.*
- *If you have two files that have synchronized timecode — such as video shot on a 3D camera that creates separate left- and right-eye clips — you don't need to align the audio and video. Just select the clips in the Project Media window and choose* **Pair as Stereoscopic 3D Subclip** *from the shortcut menu.The first stream will be used and paired with the next stream.*

  *If you need to change the mode for a media file or swap the left/right images, you can use the* **Media** *tab of the Media Properties dialog. For more information, see Modifying media file properties on page 284.*
- *If you want to add stereoscopic 3D depth to tracks using 3D compositing, you can use the* **Stereoscopic 3D Camera** *controls on the Track Motion dialog. For more information, see 3D compositing on page 310.*

Supported multistream formats:

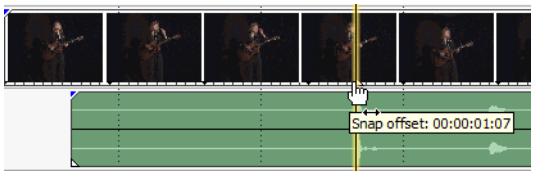
- Dual-stream AVI or QuickTime files
- 3D AVC files created by 3D Bloggie HD cameras
- MPO (multiple picture object) 3D still images
- CineForm Neo3D 5.1 or later (a CineForm product or the free Neo player is required to read Cineform Neo3D files)
- Two separate files paired as described in this topic

1. Add your media to the timeline using **Add Across Tracks** mode so the video for the left and right eyes is on separate tracks. In the following example, the left-eye track is above the right-eye track.
2. Use one of the following methods to align the audio and video so the video output is synchronized.
   - If you used a slate or a loud clap for your synchronization point, you can align the events to within a frame of each other using the audio waveforms:
     a. Roughly align the audio waveforms by dragging events in the timeline.
     b. Use the Zoom controls at the bottom-right corner of the timeline to zoom in on the waveform.
     c. Verify **Quantize to Frames** is enabled because you want video frames to be aligned even if the audio is slightly out of alignment.
     d. Drag a track's border to make the tracks taller and view large waveforms.
     e. Use Shift+Up Arrow to magnify the waveforms if necessary.
     f. Click the event you want to move and press 1 or 3 on the numeric keypad to nudge the event by frames to the left or right.

     
   - Synchronizing a video event:

     **Note:** *These steps require snapping to be enabled, so if you have not already done so, turn snapping on by clicking the* **Enable Snapping** *button (). For more information, see Snapping events on page 101.*

     a. Solo the video track.
     b. Position the cursor at the synchronization point and drag the event's snap offset so it snaps to the cursor. *For more information, see Using the event snap offset on page 103.*

     c. Repeat steps a and b for each clip.
     d. Drag the cursor to a snap point, and then snap the other clips to the cursor.

     If the cameras were not genlocked together (shooting at the same cadence) you may find one to be up to half a frame ahead of the other. Unless your scene has lots of fast motion, this is acceptable; just be sure to get them as close as possible on the timeline.
3. Verify alignment:
   a. Drag the **Level** slider on the top track to set its opacity to 50 percent.
   b. Find a portion of the video with good movement and verify the motion is the same in both clips and that one clip does not lead the other.

   If the cameras were not genlocked together (shooting at the same cadence), you may find that one clip is up to half a frame ahead of the other. Unless your scene has lots of fast motion, this is acceptable.

4. Select both video events, right-click one of the events, and choose **Pair as Stereoscopic 3D Subclip**.

   One video event is deleted from the timeline, the active take for the event is set to the new multistream subclip, and a new multistream clip is added to the Project Media window. If you view the clip properties for the new subclip, you'll see that the **Stereoscopic 3D Mode** is set to **Pair with next stream**.

5. Delete the audio and video tracks you created in step 1.

   After synchronizing the events, you will have a paired stereoscopic subclip in the Project Media window. You can drag these clips to the timeline as stereoscopic 3D media.

**Tip:** *If your camera rig used mirrors or inverted cameras and produced flipped or rotated images that were not corrected in camera, you can correct the clip with the Stereoscopic 3D Adjust plug-in. For more information, see* *Aligning left- and right-eye views and adjusting depth on page 128*.

## Aligning left- and right-eye views and adjusting depth

It is very important that stereoscopic 3D video have differences between the views only in horizontal displacement. Any vertical or rotational misalignment will detract from the viewing experience and may even cause viewer discomfort. Also, it is important to limit the amount and direction of horizontal offset to create comfortable depth.

For example, when shooting with parallel-axis cameras, all of the action is usually in front of the screen, and you need to use horizontal image translation to push most of it behind the screen.

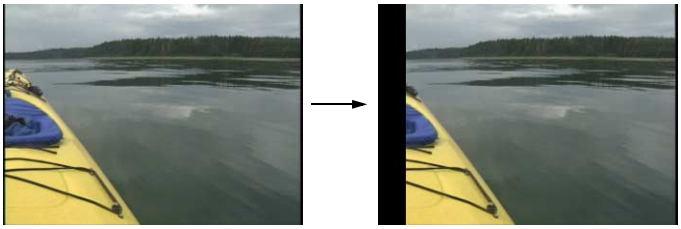
Use the 3D glasses in combination with viewing the output without the glasses to create good alignment and depth settings. You usually want all of the action behind the screen plane, only crossing the screen plane for dramatic or special effect. However, make sure never to create divergence, where the left-eye picture would appear more than 2.5 inches to the left of the right-eye picture on the largest screen where your movie will be shown.

For example, if the largest screen to be used is 16:9 with a 106-inch diagonal, the width is 87 percent of the diagonal, or about 92 inches. With 1920x1080 content, 2.5 inches is only 52 pixels, so make sure your distant objects are never more than 52 pixels apart.

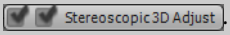
You can use the Stereoscopic 3D Adjust plug-in to adjust horizontal offset, vertical offset, keystoning, and rotation. This plug-in can be applied at the event level, track level, or video output level. *For more information about applying video effects, see* *Applying video effects on page 301* .

You can use the plug-in's controls as follows:

| Item | Description |
|---|---|
| **Horizontal Offset** | Drag the slider to adjust the horizontal alignment of the left- and right-eye views to set the perceived position of the video relative to screen depth. |
| **Vertical Offset** | If left- and right-eye views are not aligned vertically, drag the slider to correct the offset. |
| **Zoom** | If left- and right-eye views are not zoomed identically, drag the slider to correct the offset. |
| **Keystone** | Drag the slider to correct for image keystoning. Image keystoning occurs when the left- and right-eye cameras are not parallel. |
| **Rotation** | Drag the slider to correct for camera tilt in the left- and right-eye views. |
| **Auto Correct** | Click to analyze video and automatically calculate values for **Vertical Offset**, **Zoom**, **Keystone**, and **Rotation**. |
| **Flip Horizontal** | Choose a setting from the drop-down list to flip the image for horizontally inverted cameras. |
| **Flip Vertical** | Choose a setting from the drop-down list to flip the image for vertically inverted cameras. |
| **Automatic Crop** | Select this check box if you want to automatically crop the left- and right-eye views during adjustment to prevent black borders created by the plug-in's adjustments. |
| **Crop** | When the **Automatic Crop** check box is cleared, you can drag this slider to adjust image cropping. |

| Item | Description |
|---|---|
| **Floating windows** | Drag the **Left** or **Right** sliders as needed to correct for screen-edge violations.<br>If your stereoscopic 3D project contains objects that cross the screen edge and appear in front of the screen, users will see conflicting depth cues: the 3D effect tells the users eyes that an object should appear in front of the screen, but the edge of the screen contradicts the screen depth.<br>For example, in the following example, dragging the **Left** slider masks the left edge of the frame to prevent the kayak from crossing the edge of the screen.<br>  |

**Tips:**

- *3D depth adjustment is a complex process and is out of the scope of this document. For more information, please review a reference such as 3D Movie Making: Stereoscopic Digital Cinema from Script to Screen by Bernard Mendiburu.*
- *When you're working with a stereoscopic 3D project, a separate check box is displayed in the Video FX window for the left- and right-eye video:* 

*. By limiting an effect to the left or right eye only, you can use multiple instances of a plug-in with different settings for each eye.*

## Rendering a stereoscopic 3D project

When you render your project, the **Stereoscopic 3D mode** setting from the **Video** tab in the Project Properties dialog is used by default.

If you want to use a different rendering format (to deliver separate left- and right-eye masters, for example, or to create multiple versions of your project), you can change the rendering mode.

Supported 3D rendering formats:

- CineForm Neo3D (requires CineForm NeoHD, Neo4k, or Neo3D 5.1 or later). You can create a custom QuickTime or AVI render template that uses CineForm as your video format. Rendering with this template will create a Neo3D file that can be used by any application that supports the CineForm stereoscopic 3D format.
- Two separate files. You can create two custom templates and use the **Project** tab in the Custom Settings dialog to set the **Stereoscopic 3D mode** for one template to **Left Only** and the other to **Right Only**. You can then render the files separately or use **Tools** > **Scripting** > **Batch Render** to render the left- and right-eye files.

1. From the **File** menu, choose **Render As** to display the Render As dialog.
2. Use the Output File controls to choose where you want to save your file:
   a. The **Folder** box displays the path to the folder where your file will be saved. Click the down arrow to choose a recently used folder, or click the **Browse** button to specify a new folder.
   b. Type a name in the **Name** box, or click the **Browse** button and select a file in the browse window to replace an existing file.
3. Use the Output Format controls to choose the type of file you want to create.

   The Output Format box displays the file types and formats you can use to render your file. You can double-click headings (or click the arrow buttons) to expand or collapse lists of available templates.
4. Click the **Customize Template** button to create a new template.
5. In the Custom Settings dialog, click the **Project** tab.
6. From the **Stereoscopic 3D mode** drop-down list, choose the setting that you want to use for rendering your project.

   Choose **Use project settings** if you want to use the setting from the **Video** tab in the Project Properties dialog, or choose another mode if you want to override the project setting when rendering.

| Setting | Description |
|---|---|
| **Use project settings** | Uses the setting from the **Video** tab in the Project Properties dialog. |
| **Side by side (half)** | Choose this setting when your project will contain left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed as half of the available horizontal resolution.<br>**YouTube 3D**<br>YouTube 3D uses frame-compatible video, so you can create a custom render template using a format that is compatible with YouTube, such as XDCAM EX, Windows Media Video, or MainConcept MPEG-2. For the custom template, set the stereoscopic 3D mode to **Side by side (half)** and select the **Swap Left/Right** check box because YouTube 3D defaults to this layout.<br>When you upload your video to YouTube, add **yt3d:enable=true** as a tag to enable 3D viewing. Also add **yt3d:aspect=16:9** (or **yt3d:aspect=4:3**) to set the viewing frame aspect ratio.<br>**DVD and Blu-ray Disc**<br>When you use **Tools** > **Burn Disc** > **Blu-ray Disc** in a stereoscopic 3D project, Vegas Pro will render a Blu-ray 3D Disc image file (.iso) for commercial BD-ROM preparation testing. *For more information, see Burning a Blu-ray Disc on page 395.*<br>If your project is destined for professional Blu-ray 3D™ replication, Vegas Pro can prepare content in full HD per-eye format by rendering two separate files (see **Left only** and **Right only** below), which can be read by an MVC encoder such as the Dualstream 3D encoder (*http://www.sonycreativesoftware.com/blurayencoding*) and authored using a tool such as Blu-print (*http://www.sonycreativesoftware.com/bluprint*). |
| **Side by side (full)** | Choose this setting when your project will contain left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed using the full horizontal resolution. |
| **Top/bottom (half)** | Choose this setting when your project will contain left- and right-eye views stacked in a single frame.<br>Left- and right-eye views are displayed as half of the available vertical resolution. |
| **Top/bottom (full)** | Choose this setting when your project will contain left- and right-eye views stacked in a single frame.<br>Left- and right-eye views are displayed using the full vertical resolution. |
| **Anaglyphic (red/cyan)**<br>**Anaglyphic (amber/blue)**<br>**Anaglyphic (green/magenta)** | Choose an anaglyphic setting when your project will contain left- and right-eye views in a single frame. |
| **Line alternate** | Choose this setting when your project will be displayed on a line-alternate 3D monitor.<br>Left- and right-eye views are interlaced using half of the available vertical resolution. |
| **Checkerboard** | Choose this setting when your project will be displayed on a DLP-based 3D monitor.<br>Left- and right-eye views are tiled using half of the available horizontal and vertical resolution. |
| **Left only**<br>**Right only** | Choose the **Left only** or **Right only** setting if you're creating separate renders for the left- and right-eye outputs.<br>**Tip:** *You can use the Batch Render script to automate the process. Create two custom rendering templates: for one template, set the stereoscopic 3D mode to* **Left only** *and set the other template's stereoscopic 3D mode to* **Right only**. *Then choose* **Tools** > **Scripting** > **Batch Render**, *select your format and select the check box for your two templates, set the destination folder and file name, and click* **OK**. *Vegas Pro will render each file with the name of the template appended to the file name.* |
| **Blend** | Choose this setting to blend the left- and right-eye images. This setting is useful when adjusting events. |
| **Difference** | Choose this setting when performing vertical adjustments to minimize vertical disparity. |

7. Select the **Swap Left/Right** check box if you need to switch the left- and right-eye pictures. This setting is useful if you're using a line-alternate display that displays the right eye on top, if you're using magenta/green anaglyphic glasses, or to create cross-eye free-view 3D.
8. Drag the **Crosstalk cancellation** slider if you experience image bleed-through. For example, if you see right-eye images in your left eye, you can adjust the **Crosstalk cancellation** slider to compensate.

   When your project's **Stereoscopic 3D mode** is set to **Side by side**, **Top/bottom**, **Line alternate**, or **Checkerboard** mode, crosstalk cancellation is active only when the **Full-resolution rendering quality** drop-down list is set to **Good** or **Best**. When using anaglyphic modes, crosstalk cancellation is active for any quality level.
9. Save your template for future use:
   a. Type a name in the **Template** box to identify your rendering template.
   b. Click the **Save Template** button ( ).
   c. Click **OK** to return to the Render As dialog.
10. Click **Render** to render your project using your new template.

Chapter 7

# Working with XDCAM Video

Vegas® Pro software provides all the tools you need to edit proxy and full-resolution HD and SD XDCAM MXF files natively, with no transcoding required. Vegas Pro supports all HD and SD XDCAM compression types, all frame rates, all aspect ratios, multichannel audio, and essence marks. All proxy and full-resolution XDCAM source file types can be mixed in a single timeline, edited, and transferred back to XDCAM.

The following sections provide workflows for efficient editing of video from an XDCAM EX camera or an XDCAM/XDCAM HD camera or deck.

## XDCAM EX workflow

The following topic provides a workflow for efficient editing of video from an XDCAM EX camera.

XDCAM EX differs from XDCAM/XDCAM HD in several key areas.

- XDCAM EX cameras record to SxS flash memory rather than optical disc.
- XDCAM EX cameras record full-HD video to MPEG-2 (MP4) format.
- XDCAM EX video is not visible in the XDCAM Explorer window. Use the Device Explorer window to import clips from an XDCAM EX device. *For more information, see Using the Device Explorer on page 60.*
- When editing XDCAM EX video, you'll edit full-resolution MXF files. Proxies are not available.

1. Shoot your video with your XDCAM EX camera.
2. Transfer your clips from your camera to your computer.
   a. Install the SxS device driver.
   b. Connect your camera (or card reader) to your computer with a USB cable.
   c. Your camera will prompt you to **Connect USB Now?** Choose **Execute**.
   d. Use the Device Explorer window to import clips from your XDCAM EX device to the Project Media window. *For more information, see Using the Device Explorer on page 60.*

> **Note:** *Previous versions of Vegas Pro required you to convert XDCAM EX clips to MXF format before editing.*
>
> *This conversion is no longer required, but the workflow is still supported. If you want to wrap your XDCAM EX clips in MXF format, use XDCAM EX Clip Browsing Software.*

3. Drag your captured clips from the Project Media window to the timeline to create events.
4. Edit your project as needed.

5. Render your project for your destination format. You can also render to XDCAM EX format by choosing **XDCAM EX (*.MP4)** in the Output Format box in the Render As dialog.

**Note:** *The following notes apply when rendering XDCAM EX format files:*

- *Only embedded XML metadata is included with rendered files. Embedded XML metadata supports markers and regions; title, author, and description summary information; recording date/time; and timecode in/out.*
- *When you intend to transfer files back to SxS media, select the* **Write segmented files if output exceeds 4 GB** *check box on the* **Video** *tab of the Custom XDCAM EX Settings dialog (click the* **Custom** *button in the Render As dialog and then click the* **Video** *tab). When this check box is selected, large files will be segmented at 4 GB for compatibility with the SxS file format.*
- *XDCAM EX supports smart rendering across the following formats when the source and destination MPEG-2 video match in frame size, bit rate, profile, and level:*
  - *SP 18.3 Mbps CBR 1280x720p to/from XDCAM EX and HDV HD-1*
  - *SP 25 Mbps CBR 1440x1080i to/from XDCAM EX, XDCAM HD, and HDV HD-2*
  - *HQ 35 Mbps VBR 1440x1080 to/from XDCAM EX and XDCAM HD*
  - *HQ 35 Mbps VBR 1280x720p to/from XDCAM EX*
  - *HQ 35 Mbps VBR 1920x1080 to/from XDCAM EX*

  *The* **Enable no-recompress long-GOP rendering** *check box on the* **General** *tab of the Preferences dialog must be selected to enable smart rendering.*

## XDCAM and XDCAM HD workflow

You can use MXF files just like any other supported media type. The following sections provide a workflow for efficient editing.

**Note:** *The XDCAM deck is not available for external monitor or print to tape while in XDCAM Media Drive mode. Click the* **Safely Remove Hardware** *icon (* *) in the Windows system tray and choose your XDCAM device from the menu to disconnect the device. You can then switch to AV/C mode and reconnect to enable external monitor and print to tape functionality.*

The basic workflow for working with XDCAM is as follows:

1. Set up your XDCAM device.

   The first step in working with XDCAM is to set up your computer to communicate with your XDCAM camera or deck. You can use FTP (file transfer protocol) or XDCAM Media Drive to transfer between your computer and device. For specific information on setting up your device and installing any necessary drivers, see its documentation. Your device must be properly installed and recognized on your computer before it can be used with Vegas Pro.

   *For information on setting up your device to work with Vegas Pro, see* *Setting up an XDCAM device on page 136*.

2. Import video from the XDCAM disc.

   Next, you need to transfer video from your XDCAM disc to your computer for editing. Depending on your project and requirements, you can transfer full-resolution files, proxy-resolution files, or both. *For more information, see* *Importing XDCAM discs on page 139*.

3. Edit the video on the timeline.

   Editing XDCAM video is identical to editing DV on the timeline. You can choose whether you want to edit full- or proxy-resolution files on the timeline. *For more information, see* *Editing XDCAM clips on the timeline on page 141*.

4. Replace proxy files with full-resolution versions (optional).

   If you're using proxy files for timeline editing, replace the clips with full-resolution versions before rendering or exporting back to XDCAM disc. *For more information, see* *Replacing proxy-resolution clips with full-resolution media (conforming media) on page 143*.

5. Export video back to an XDCAM disc.

   If you're planning to render your movie to a different format, render just as you would any other project.

   If you want to export your movie to an XDCAM disc, you can either export the current project or export a rendered MXF file. *For more information, see* *Exporting video to an XDCAM disc on page 144*.

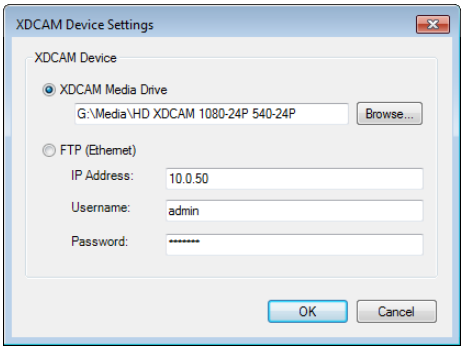
**Note:** *The XDCAM deck is not available for external monitor or print to tape while in XDCAM Media Drive mode. Click the* **Safely Remove Hardware** *icon in the Windows system tray and choose your XDCAM device from the menu to disconnect the device. You can then switch to AV/C mode and reconnect to enable external monitor and print to tape functionality.*

### Setting up an XDCAM device

Use the following procedure if you need to set up an XDCAM deck or camera for transferring clips, replacing proxy files with full-resolution clips, or exporting video to an XDCAM device.

**Note:** *The XDCAM deck is not available for external monitor or print to tape while in XDCAM Media Drive mode. Click the* **Safely Remove Hardware** *icon (*) *in the Windows system tray and choose your XDCAM device from the menu to disconnect the device. You can then switch to AV/C mode and reconnect to enable external monitor and print to tape functionality.*

1. Click the **Device** button in the Export Video to XDCAM Disc or Import XDCAM Disc dialog. The XDCAM Device Settings dialog is displayed.
   - To display the Export Video to XDCAM Disc dialog, click the **Export Video to Sony XDCAM Disc** button ( ) in the XDCAM Explorer window.
   - To display the Import XDCAM Disc dialog, click the **Import XDCAM Disc** button ( ) in the XDCAM Explorer window.




2. Choose the XDCAM device where you want to import/export clips.
   - Select the **XDCAM Media Drive** radio button if your XDCAM camera or deck is connected directly to your computer. In this mode, your camera or deck is accessible much like an external drive.

     Click the **Browse** button and choose the drive letter of the camera or deck.

**Important:** *Choose the drive letter of the camera or deck only; do not navigate into the folders on the disc.*

   - Select the **FTP (Ethernet)** radio button if your camera or deck is connected to your network.

     Type the camera or deck's IP address in the **IP Address** box.

     In the **Username** box, type admin.

     In the **Password** box, type the device/model number of your camera or deck. For example, if you're exporting clips to a PDW-1500 deck, type PDW-1500.

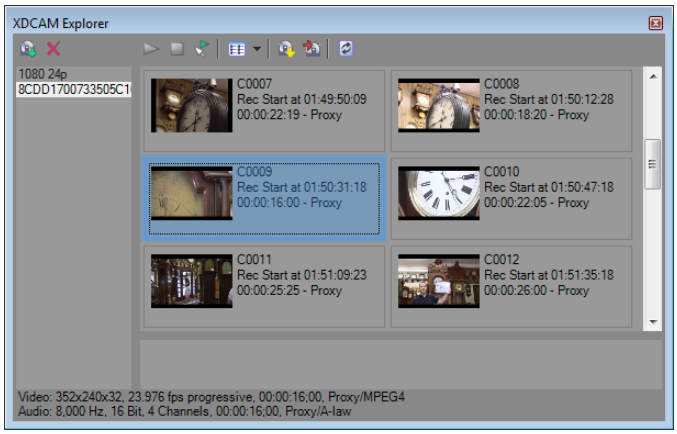
**Tip:** *The XDCAM deck is not available for external monitor or print to tape while in XDCAM Media Drive mode. Using FTP transfers allows you to export to a remote device and or use the device's IEEE-1394 connection in AV/C mode for external monitor previewing.*

3. Click **OK**.

**Note:** *For information about using your camera or deck, refer to its documentation.*

### Using the XDCAM Explorer window

From the **View** menu, choose **XDCAM Explorer** (or press Ctrl+Alt+F5) to display the XDCAM Explorer window, which you can use to locate, import, and export XDCAM clips.




| Item | Name | Description |
|---|---|---|
| | **Disc List** | Displays a list of all XDCAM discs from which you've imported clips. Select a disc name to display its clips in the right side of the window.<br>The imported disc is not associated with the current project. Imported discs are available in the XDCAM Explorer window until you delete them from your computer.<br>Right-click a disc and choose **Rename** from the shortcut menu to change a disc's name.<br>For example, if you've written "Joe's Tire Spot" on your XDCAM disc, you can type that name so you don't have to try to identify the disc in the XDCAM Explorer window using its 32-digit identifier. |
| | **Contents Pane** | Displays the clips from the selected disc.<br>Full-resolution clips are labeled **Full**, and proxy files are labeled **Proxy**.<br>If you've transferred proxy files only, you can right-click a proxy file and choose **Import Full Resolution Files** from the shortcut menu to transfer the full-resolution version of the proxy clip to your computer. Files are imported to the same folder where you transferred the proxy files.<br>If you've transferred metadata only without transferring clips, no thumbnail is displayed. Right-click a metadata entry and choose **Import Full Resolution Files** or **Import Proxy Files** from the shortcut menu.<br>If the disc contains edit lists that you created on your deck or camera, they are displayed at the bottom of the contents pane. Click the down arrow next to the **Views** button ( ) and choose **Edit Lists** from the menu to show or hide edit lists. |
| | **Import XDCAM Disc** | Click to import clips from an XDCAM disc. You can choose to import proxy-resolution clips, full-resolution clips, or both. For more information, see *Importing XDCAM discs on page 139*. |
| | **Delete Selected XDCAM Disc from Capture Folder** | Select a disc in the left pane and click this button to delete the disc's clips from your computer. |
| | **Play Clip** | Click to play the selected clip. |

| Item | Name | Description | | |
|---|---|---|---|---|
| | **Stop** | Click to stop playback. | | |
| | **Auto Preview** | Automatically preview media files when you click them in the XDCAM Explorer window. | | |
| | **Views** | Click the down arrow and choose a command from the menu to change the way clips are displayed in the XDCAM Explorer. | | |
| | | **All Essence Marks** | Displays a separate thumbnail for each essence marker in a clip. | |
| | | **Shot Marks 1 & 2** | Displays a separate thumbnail for each shot marker in a clip. | |
| | | **Clips** | Displays a single thumbnail for each clip. | |
| | | **Custom** | Displays the Custom Essence Mark Filter dialog. Select the check box for each essence mark you want to display as thumbnails, and then click **OK** to close the dialog. | |
| | | | **Record Start** | Created when recording begins and stops. |
| | | | **Record End** | |
| | | | **Shot Mark 1** | Created manually during recording. |
| | | | **Shot Mark 2** | |
| | | | **Flash** | Created when a sudden change in brightness occurs. |
| | | | **Filter Change** | Created when the filter is changed on the camera. |
| | | | **Gain Change** | Created when the gain value is changed on the camera. |
| | | | **Shutter Speed Change** | Created when the shutter speed is changed on the camera. |
| | | | **White Balance Change** | Created when the white balance is changed on the camera. |
| | | | **Over Audio Limiter** | Created when the audio level exceeds 0 dB. |
| | | **Edit Lists** | If you've created an edit list on your camera or deck, you can display those edit lists in the XDCAM Explorer. Edit lists are displayed in the lower half of the XDCAM Explorer.<br>Right-click an edit list and choose **Add to Current Project Using Proxy Files** or **Add to Current Project Using Full Resolution Files** from the shortcut menu to add the edit list to the timeline at the cursor position. | |
| | **Conform XDCAM Media in Current Project** | Click to replace proxy-resolution files with full-resolution files before rendering your project or exporting your video to an XDCAM disc.<br>If the full-resolution clips are not available on your computer, the Conform XDCAM Media in Current Project dialog is displayed. Insert the specified disc and click **Continue** to import the full-resolution clips to your computer.<br>If you need to choose a different XDCAM device or import method, click the **Device** button. For more information, see *Setting up an XDCAM device on page 136*.<br>Clips are imported if necessary, and the events on the timeline are updated to use the full-resolution files. | | |
| | **Export Video to XDCAM Disc** | Click to transfer video to an XDCAM disc in a camera or deck.<br>You can choose to render the current project to MXF or export an already-rendered MXF file. For more information, see *Exporting video to an XDCAM disc on page 144*. | | |
| | **Refresh XDCAM Discs by Examining Capture Folders** | Click to examine capture folders for files that have been added since the application was started. You can use this button to view files that you copy manually from an XDCAM disc to your computer. | | |

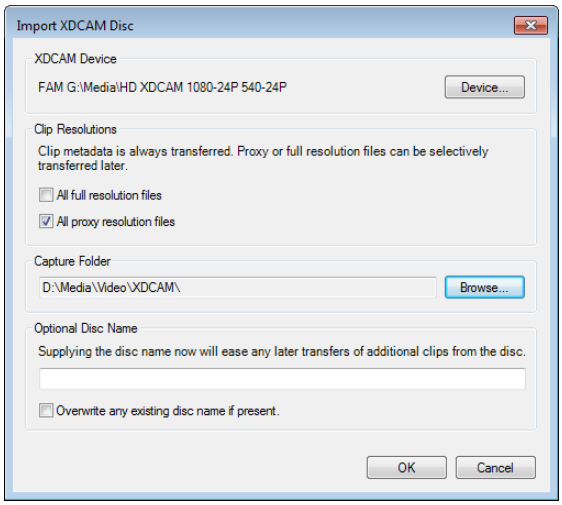
## Importing XDCAM discs

You can use the XDCAM Explorer window to import full- or proxy-resolution clips from XDCAM discs to your computer for editing.

**Tips:**

- *If you delete XDCAM clips from your computer, those clips will appear offline in your projects. You can reimport the clips by right-clicking the clips in the Project Media window and choosing* **Recapture** *from the shortcut menu.*
- *The XDCAM deck is not available for external monitor or print to tape while in XDCAM Media Drive mode. Click the* **Safely Remove Hardware** *icon ( ) in the Windows system tray and choose your XDCAM device from the menu to disconnect the device. You can then switch to AV/C mode and reconnect to enable external monitor and print to tape functionality.*
- *Use the Device Explorer window to import clips from an XDCAM EX camera.For more information, see* *Using the Device Explorer on page 60**.*

1. From the **View** menu, choose **XDCAM Explorer** to display the XDCAM Explorer window if it isn't already visible.
2. Click the **Import XDCAM Disc** button ( ) in the XDCAM Explorer window. The Import XDCAM Disc dialog is displayed.

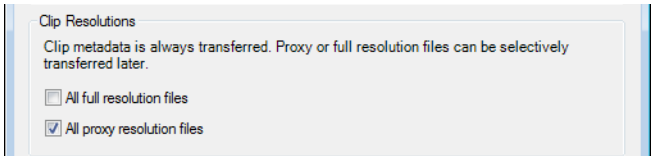

Import XDCAM Disc
XDCAM Device
FAM G:\Media\HD XDCAM 1080-24P 540-24P
Device...
Clip Resolutions
Clip metadata is always transferred. Proxy or full resolution files can be selectively transferred later.
All full resolution files
All proxy resolution files
Capture Folder
D:\Media\Video\XDCAM\
Browse...
Optional Disc Name
Supplying the disc name now will ease any later transfers of additional clips from the disc.
Overwrite any existing disc name if present.
OK
Cancel

3. The XDCAM Device box displays the current XDCAM camera or deck.

   If you need to choose a different XDCAM device or import method, click the **Device** button. *For more information, see* *Setting up an XDCAM device on page 136**.*

**Note:** *For information about using your camera or deck, refer to its documentation.*

4. In the **Clip Resolutions** box, select check boxes to indicate which clips you want to import:


Clip Resolutions
Clip metadata is always transferred. Proxy or full resolution files can be selectively transferred later.
All full resolution files
All proxy resolution files

**Tip:** *Proxy files are much smaller than the full-resolution versions. If you're working on a system with limited disk space or processing power, you can edit the smaller proxy files on the timeline and replace the proxies with full-resolution files before rendering.*

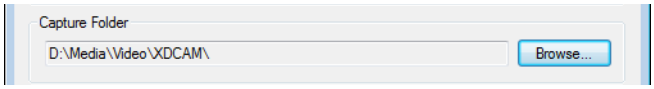
*Proxy editing is ideal for storyboarding or rough-cut editing.*

- Clear both check boxes if you want to import clip information (metadata) only without importing clips.

  You can import clips later by right-clicking a clip in the XDCAM Explorer and choosing **Import Full Resolution Files** or **Import Proxy Files** from the shortcut menu.
- Select the **All full resolution files** check box to import full-resolution clips.
- Select the **All proxy resolution files** check box to import low-resolution clips for quick timeline editing and preview.

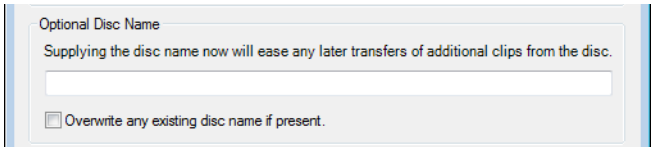
  If you're working on a system with limited disk space or processing power, you can edit the smaller proxy files on the timeline and replace the proxies with full-resolution files before rendering.

5. The **Capture Folder** box displays the path to the folder where clips will be imported. Click the **Browse** button to choose a folder.




**Tip:** *You can also copy XDCAM discs to the capture folder manually. Simply copy the files and folders to the specified capture folder (preserving the XDCAM disc folder/file structure). The next time you start Vegas Pro, the disc will be available in the XDCAM Explorer window.*

6. Type a name in the **Optional Disc Name** box if you want to assign a friendly name to the disc.


Optional Disc Name
Supplying the disc name now will ease any later transfers of additional clips from the disc.
Overwrite any existing disc name if present.

For example, if you've written "Joe's Tire Spot" on your XDCAM disc, you can type that name so you don't have to try to identify the disc in the XDCAM Explorer window using its 32-digit identifier.

7. Click the **OK** button to start importing clips. The disc label is added to the left pane in the XDCAM Explorer window, and the clips are displayed in the right pane. *For more information, see Using the XDCAM Explorer window on page 137.*
8. You're ready to start editing your XDCAM clips on the timeline.

**Notes:**

- *Select the* **Import MXF as multichannel** *check box on the* **General** *tab of the Preferences dialog if you want to import MXF files from XDCAM cameras and decks with multichannel audio. When the check box is cleared, audio from MXF files will be imported as stereo, but you can access the other channels by right-clicking the event and choosing* **Channels** *from the shortcut menu.*
- *The imported disc is not associated with the current project. Imported discs are available in the XDCAM Explorer window until you delete them from your computer.*
- *Imported clips are not added to the Project Media window. Drag a clip to the timeline to add it to your project or right-click a clip and choose* **Add to Project Media List** *from the shortcut menu.*

## Editing XDCAM clips on the timeline

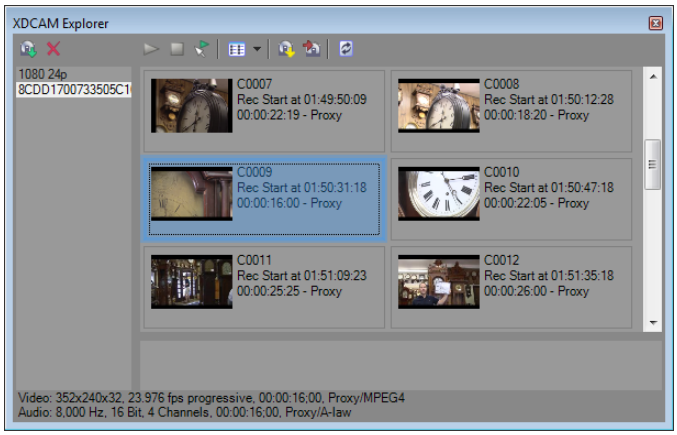
### Creating and editing a project

You can use MXF files just like any other supported media type on the timeline. Depending on your workflow, you might want to use proxy or full-resolution files on the timeline.

**Tip:** *Proxy files are much smaller than the full-resolution versions. If you're working on a system with limited disk space or processing power, you can edit the smaller proxy files on the timeline and replace the proxies with full-resolution files before rendering.*

*Proxy editing is ideal for storyboarding or rough-cut editing.*

1. Import the clips from your XDCAM camera or deck to your local hard drive. *For more information, see* *Importing XDCAM discs on page 139*.
2. Select an imported XDCAM disc on the left side of the XDCAM Explorer window. The imported clips are displayed in the right pane.




   If the disc contains edit lists that you created on your deck or camera, they are displayed at the bottom of the contents pane. Click the down arrow next to the **Views** button ( ) and choose **Edit Lists** from the menu to show or hide edit lists.
3. Drag clips from the XDCAM Explorer window to the timeline if you want to create events, or drag them to the Project Media window to add to your project without creating events.

   Right-click an edit list and choose **Add to Current Project Using Proxy Files** or **Add to Current Project Using Full Resolution Files** from the shortcut menu to add the edit list to the timeline at the cursor position.

**Note:** *Essence marks from the MXF files are displayed as named media markers (media markers are visible in the timeline events and in the Trimmer window). Choose* **View** > **Event Media Markers** > **Show Markers** *to toggle their display.*

4. Edit your project as needed.

5. If you're working with proxy-resolution clips, replace them with full-resolution clips before rendering your project or exporting it to an XDCAM disc:

   a. Click the **Conform XDCAM Media in Current Project** button ( ) in the XDCAM Explorer window.

   b. If the full-resolution clips are not available on your computer, the Conform XDCAM Media in Current Project dialog is displayed.

   c. Insert the specified disc.

      If the events on the timeline have been trimmed, you can select the **Trim clips to used regions when possible** check box (available only in file-access mode) to import only the portions of the media files required for the events.

      If you need to choose a different XDCAM device or transfer method, click the **Device** button. *For more information, see* *Setting up an XDCAM device on page 136*.

   d. Select the **Trim clips to used regions when possible** check box (available only in file-access mode) if you want to trim full-resolution clips to import only the portions used in your project.

> **Note:** *Some XDCAM decks might require updated firmware to support trimming clips when connecting via Ethernet (FTP).*

   e. Click **Continue** to import the full-resolution clips.

   f. Repeat steps 5c and 5d as needed.

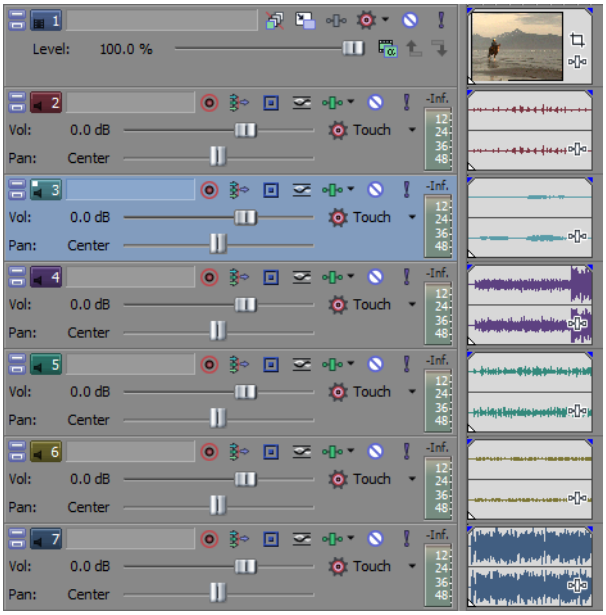
      Clips are imported to your computer if necessary, and the events on the timeline are updated to use the full-resolution files.

6. You can now render your project or export it to an XDCAM deck or camera.

### Setting up your project for multichannel audio

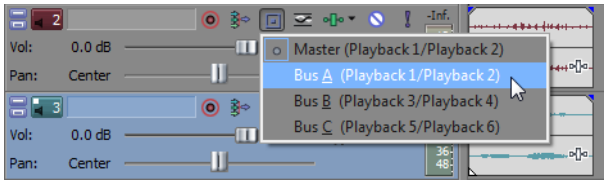
If you imported your XDCAM clips with the **Import MXF as multichannel** check box selected on the General tab of the Preferences dialog, your MXF files will be imported with multichannel audio. When you add the clip to the timeline, the audio channels will be added across tracks.

The example below shows an MXF clip with six-channel audio. To take advantage of multichannel mapping in Vegas Pro, set up your project to map each audio channel to a separate bus.

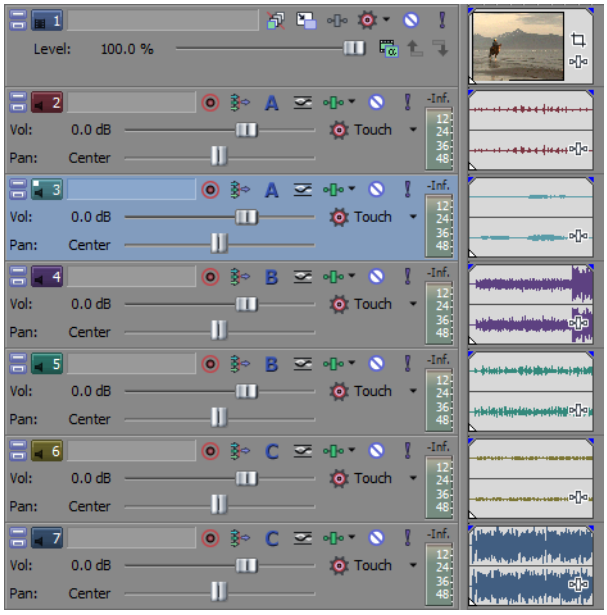



1. From the **Insert** menu, choose **Audio Bus** (or click the **Insert Bus** button ( ) in the Mixing Console) to create a bus in the Mixing Console. Because we're working with six-channel audio, we'll add three stereo busses.

2. Now click the bus button ( ) on each track to assign the channels to busses.


Vol: 0.0 dB
Pan: Center
Master (Playback 1/Playback 2)
Bus A (Playback 1/Playback 2)
Bus B (Playback 3/Playback 4)
Bus C (Playback 5/Playback 6)

We'll assign channels one and two to Bus A, channels three and four to Bus B, and channels five and six to Bus C.




Alternatively, you could create one bus per channel.

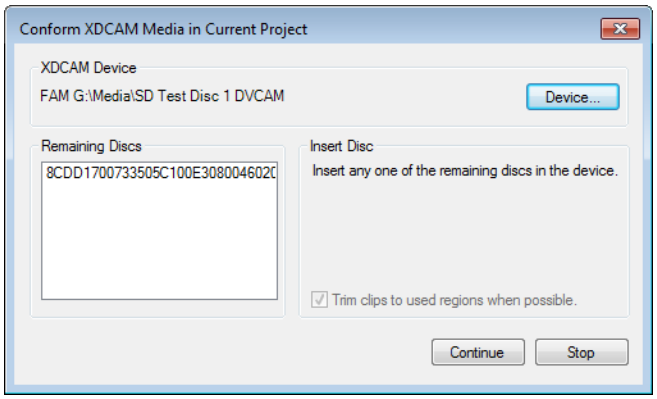
We'll use this channel mapping when you render your video or export it to an XDCAM camera or deck.

*For more information, see Exporting video to an XDCAM disc on page 144.*

### Replacing proxy-resolution clips with full-resolution media (conforming media)

If you're working with proxy-resolution clips, replace them with full-resolution clips before rendering your project or exporting it to an XDCAM disc:

1. Click the **Conform XDCAM Media in Current Project** button ( ) in the XDCAM Explorer window.
2. If the full-resolution clips are not available on your computer, the Conform XDCAM Media in Current Project dialog is displayed.



3. Insert the specified disc.

   If the events on the timeline have been trimmed, you can select the **Trim clips to used regions when possible** check box to import only the portions of the media files required for the events.

   If you need to choose a different XDCAM device or transfer method, click the **Device** button. *For more information, see Setting up an XDCAM device on page 136.*

4. Click **Continue** to import the full-resolution clips.
5. Repeat steps 3 and 4 as needed.
6. Clips are imported to your computer if necessary, and the events on the timeline are updated to use the full-resolution files.

## Exporting video to an XDCAM disc

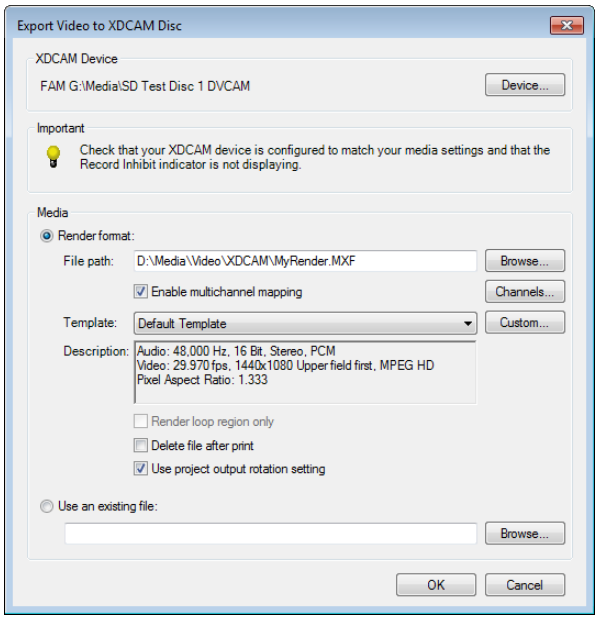
From the **Tools** menu, choose **Export Video to XDCAM Disc** (or click the **Export Video to XDCAM Disc** button ( ) in the XDCAM Explorer window) to save your project to a disc in an XDCAM camera or deck.

### Exporting video from the timeline

Use this procedure to export the current project to an XDCAM disc.

**Important:** *If you are exporting a rendered file to an XDCAM disc, the file must precisely conform to the target disc format, or the export will fail.*

1. If you want to export only a portion of your project, create a time selection that includes the section of your project.
2. From the **Tools** menu, choose **Export Video to XDCAM Disc** (or click the **Export Video to XDCAM Disc** button ( ) in the XDCAM Explorer window). The Export Video to XDCAM Disc dialog is displayed.




3. The **XDCAM Device** box displays the current XDCAM camera or deck.

   If you need to choose a different XDCAM device or transfer method, click the **Device** button. *For more information, see Setting up an XDCAM device on page 136.*

**Note:** *For information about using your camera or deck, refer to its documentation.*

4. Choose render settings:

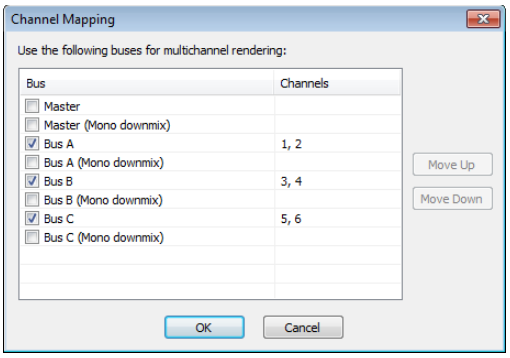
   a. Select the **Render format** radio button.

   b. In the **File path** box, type the path to the file you want to render, or click the **Browse** button to browse to the folder you want to use and then type a file name.

      This path is used to render an MXF file to your hard drive before transferring to your XDCAM device. You can delete the file after the transfer is complete.

   c. Select the **Enable multichannel mapping** check box if you want to map render multiple channels of audio.

      You can click the **Channels** button if you want to map the busses in your project to channels in the rendered file. If you don't specify a channel mapping, Vegas Pro will not render a multichannel file.




      In the Channel Mapping dialog, select the check box for each bus you want to include in the rendered file. Each stereo bus will be saved to two channels in the rendered file. If you want to save a bus to a single channel, select the **(Mono downmix)** check box for that bus.

      If you want to change order of the busses in the channel mapping, select the bus and click the **Move Up** or **Move Down** button.

      Click **OK** to close the Channel Mapping dialog and return to the Export Video to XDCAM Disc dialog. *For more information, see Setting up your project for multichannel audio on page 142*.

   d. From the **Template** drop-down list, choose the setting that matches your destination disc.

      Information about the selected rendering template is displayed in the **Description** box.

      If you choose **Default Template**, the number of channels will match the number of channels specified in the Channel Mapping dialog.

   e. Select the **Render loop region only** check box if you want to export only the portion of your project that you selected in step 1.

   f. Select the **Delete file after print** check box if you want to delete the rendered file from your hard drive after exporting it to disc. If the export fails, the rendered file remains on disk so you can adjust your XDCAM device settings and export again without having to render again.

   g. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for your rendered file.

      When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated—you can use this setting to proof your project on an unrotated display.

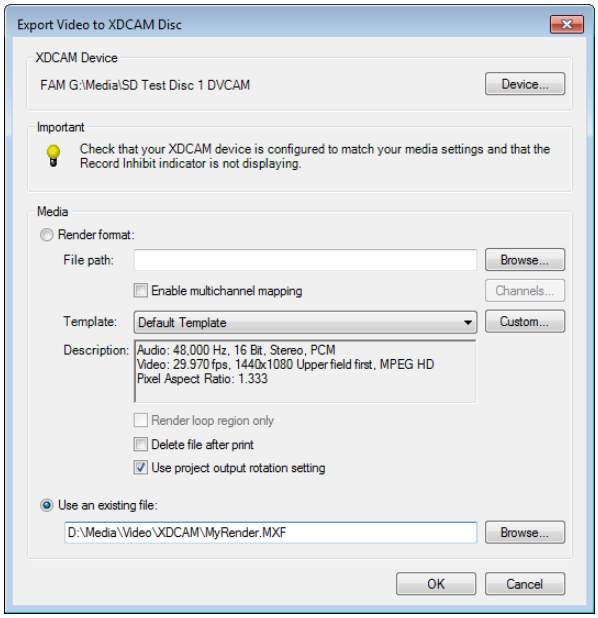
5. Click **OK**. Your project is rendered and transferred to your camera or deck.

### Exporting a rendered file

Use this procedure when you have a rendered MXF file that you want to save to an XDCAM disc.

**Important:** *If you are exporting a rendered file to an XDCAM disc, the file must precisely conform to the target disc format, or the export will fail.*

1. From the **Tools** menu, choose **Export Video to XDCAM Disc** (or click the **Export Video to XDCAM Disc** button ( ) in the XDCAM Explorer window). The Export Video to XDCAM Disc dialog is displayed.




2. The **XDCAM Device** box displays the current XDCAM camera or deck.

   If you need to choose a different XDCAM device or transfer method, click the **Device** button. *For more information, see* *Setting up an XDCAM device on page 136*.

**Note:** *For information about using your camera or deck, refer to its documentation.*

3. Choose the file you want to export:
   a. Select the **Use an existing file** radio button.
   b. In the **File path** box, type the path to the file you want to print, or click the **Browse** button to choose the file you want to print.
4. Click **OK**. The selected file is transferred to your camera or deck.

Chapter 8

# Working with Tracks

Tracks contain the media events on the timeline of a project. There are two types of tracks in a Vegas® Pro project: video and audio. Each type of track has its own features and controls. While tracks can be organized and mixed in any order, track hierarchy can be important in determining the final output for video. Because tracks are containers for events, effects that are applied to a track apply to every event in that track. *For more information, see Adding audio track effects on page 229.*

## Managing tracks

Once you have added a track to your project, you can perform basic editing tasks on it such as duplicating, deleting, and renaming.

### Inserting an empty track

Tracks are created for you when you drag events to empty spaces in the timeline. You can also add empty (eventless) tracks to a project. You can record into these tracks or use them as placeholders for specific media that you will add later. For example, you might want to create an empty track and then record a voiceover directly into a project.

1. Right-click in the timeline or the track list to display a shortcut menu.
2. Choose **Insert Audio Track** or **Insert Video Track**.

   You can also add an empty track from the **Insert** menu by choosing **Audio Track** or **Video Track**. An empty track is added at the bottom of the track list.

### Duplicating a track

You can duplicate a track in your project including all of the events contained on it. When you duplicate a track, the duplicate is placed directly below the original track. You can duplicate one track or select multiple tracks to duplicate.

1. Click the track that you want to duplicate. To select multiple tracks, click each one while pressing Shift to select adjacent tracks or Ctrl to select nonadjacent tracks.
2. Right-click and choose **Duplicate Track** from the shortcut menu.

### Deleting a track

You can delete a track from your project and all of the events contained on it. You can delete one track or select multiple tracks to delete.

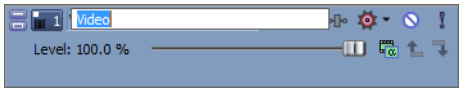
1. Select the track that you want to delete. To select multiple tracks, click each one while pressing Shift to select a range of adjacent tracks or Ctrl to select discontinuous tracks.
2. From the **Edit** menu, choose **Delete**.

**Tip:** *You can also delete a track by selecting it and pressing Delete.*

### Naming or renaming a track

Every track in your project has a scribble strip where you can type a name for the track. If the scribble strip is not visible, you might need to increase the height or width of the track by dragging the track's edge to reveal it. *For more information, see Changing track height on page 150.*

1. Double-click the scribble strip. Any existing name is highlighted on the strip.



2. Type the new track name.
3. Press Enter to save the track's name.

## Organizing tracks

Vegas Pro software is flexible in how tracks can be organized. You can arrange, group, and resize tracks to fit your particular needs.

### Reordering tracks

When you create tracks, they are arranged in the order that they were added. It is a simple process to reorder tracks to fit your needs. You can reorder one or more tracks at a time.

**Note:** *Track hierarchy can be critical in video compositing. For more information, see Compositing on page 306.*

1. In the track list, place the mouse pointer on the track that you want to move.
2. Drag the track to the new position in the track list.

**Tip:** *When moving a track, you might want to place the mouse pointer on the track number when dragging. This helps avoid accidental modifications to other track list controls.*

### Grouping tracks

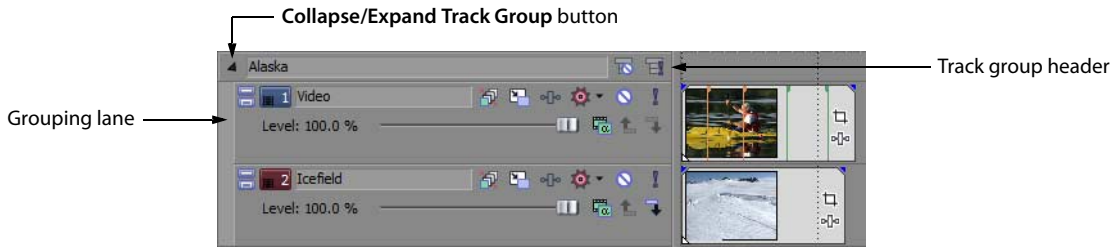
You can use track groups to organize similar tracks and hide them from view when you're not working on them. This can make the track list and timeline less cluttered and easier to work with, especially in large projects.

You can reorder track groups in the track list the same way you reorder tracks. Simply drag a track group header to a new position in the track list.

#### Creating track groups

1. Select two or more tracks to group together. Press Shift to select multiple adjacent tracks. Nonadjacent tracks cannot be grouped together.
2. Right-click one of the tracks, choose **Track Group**, and then choose **Group Selected Tracks**.

   The tracks are grouped together. Click the **Collapse/Expand Track Group** button in the track group header to close and expand the tracks in the group.




When a track group is collapsed, dark gray bars indicate the length and location of events in the collapsed tracks.

**Note:** *If you select a parent or child video track to be added to a track group, all associated parent/child tracks will also be added to the group to preserve the compositing relationship. For more information, see Compositing on page 306.*

**Important:** *When you collapse a track group, tracks and events in the group are not locked. Edits made elsewhere in the project may affect tracks and events in the collapsed track group.*

### Adding tracks to existing track groups

Drag one or more tracks into a track group to add the selected tracks to the group.

### Removing tracks from groups

Drag one or more tracks out of a track group to remove the selected tracks from the group. You can also right-click one or more selected tracks in a group, choose **Track Group**, and then choose **Ungroup Selected Tracks** to remove tracks from a group.

### Clearing track groups

1. Click the track group header to select all tracks in the group.
2. Right-click the track group header and choose **Ungroup Selected Tracks** to ungroup all tracks in the group.

> **Tip:** *You can also right-click the grouping lane and choose* **Ungroup Selected Tracks** *from the shortcut menu to clear the track group.*

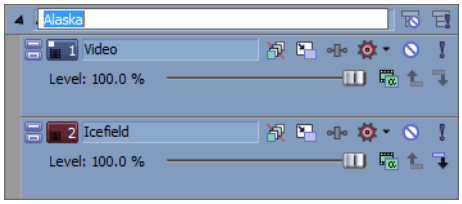
### Selecting all tracks in a group

Click a track group header or grouping lane to select all tracks in the group.

### Renaming track groups

Every track group in your project has a scribble strip where you can type a name for the track group.

1. Double-click the scribble strip. Any existing name is highlighted on the strip.




2. Type the new track group name.
3. Press Enter to save the track group's name.

## Changing track color

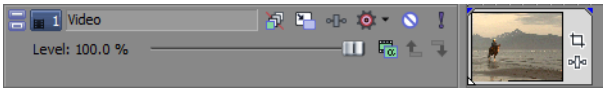
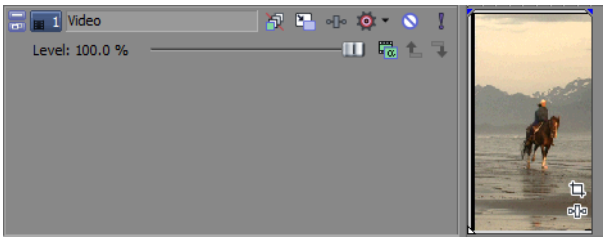
When you add a track, it is automatically assigned a color. This color is easily changed. This feature is useful if you want to use color to organize similar tracks.

1. In the track list, right-click a track to display a shortcut menu.
2. From the shortcut menu, choose **Track Display Color**, and choose a color from the submenu.

> **Tip:** *To change the available colors, use the* **Display** *tab in the Preferences dialog.*

## Changing track height

You can control track height by dragging the bottom edge of a track in the track list. You can also change track height by clicking the buttons on the track list.

| Action | Button | Resulting Track Height |
|---|---|---|
| Minimize Track Height | | |
| Restore Track Height | |  |
| Maximize Track Height | |  |

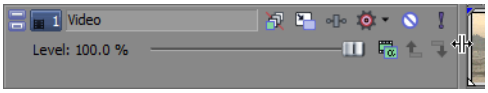
You can also use several different keyboard shortcuts to change all track heights at once:

- Press Ctrl+Shift+Down Arrow or Ctrl+Shift+Up Arrow to change the height of all tracks in your project at once.
- Press the grave accent key (`) to minimize all tracks. Press the key again to restore the tracks to their previous height. When you restore tracks to their previous height, tracks that were previously minimized are not restored. You can restore these tracks by clicking the **Restore Track Height** button ( ) on the track header.
- Press Ctrl+grave accent key (`) to make all tracks the default height.

### Resizing a track

You can resize a track by dragging its bottom or right border. Place the mouse pointer at the bottom of the track. The cursor turns into an up/down arrow ( ). Drag up or down and release the mouse to set the desired track size. You can resize the width of the track list in a similar way.

Drag to change track height...




...or to change track list width.

## Using the track list

Each track in your project has its own controls, faders, and sliders that are contained in the track list on the left side of the track. You can work with these controls to affect the events on the track.

The controls in the track list can function as trim controls or automation controls for track volume, panning, assignable effects send, and bus send levels. Adjusting the trim control affects the level of the entire track.

When a track does not use envelopes (or when the track automation mode is set to Off), the trim level is added to the track fader. For example, setting the track volume fader to +3 dB and the trim control to -3 dB produces a gain of 0 dB.

When a track uses envelopes, the trim level is added to the envelope so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.

To adjust trim levels, deselect the **Automation Settings** button ( ) in the track header. When the **Automation Settings** button is selected, the volume fader, pan slider, and multipurpose slider adjust automation settings.

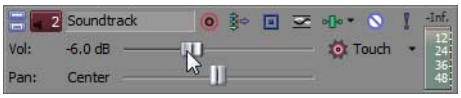
### Using the volume fader (audio only)

The fader in the track header can function as a trim control that adjusts the overall volume of the track, or it can adjust track volume automation settings. *For more information, see* *Volume or pan automation (audio only) on page 164*.

The trim level is added to the volume automation settings so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.

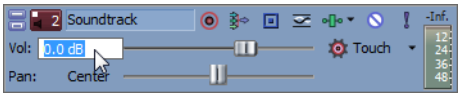
1. Deselect the **Automation Settings** button ( ) in the track header.
2. Drag the **Vol** fader to control how loud a track is in the mix. If multiple tracks are selected, all selected tracks are adjusted.

As you drag the fader, the volume level displays to the left of the fader. Double-click the fader to set it to 0.0 dB, or double-click the current volume value to enter a specific number.




Drag to change volume.

Double-click the fader to set to 0.0 dB.




Double-click the current level to enter a value.

**Tip:** *Press Ctrl while dragging or use the mouse wheel for finer control of the fader. You can also move the fader by using the right or left arrow keys.*

Volume envelopes allow you to automate track volume changes. *For more information, see* *Volume or pan automation (audio only) on page 164*.

### Using the pan slider (audio only)

The **Pan** slider in the track header can function as a trim control that adjusts the overall panning of the track, or it can adjust track panning automation settings. *For more information, see* *Volume or pan automation (audio only) on page 164*.

The trim level is added to the pan automation settings so your panning envelope is preserved, but with an offset applied. For example, setting the trim control to -9% left has the same effect as moving every envelope point 9% to the left.

**Note:** *This procedure applies to stereo panning only. For information about panning 5.1 surround projects, see Panning audio on page 252.*

**Tip:** *If you do not see this slider on a track, increase the track height. For more information, see Resizing a track on page 150.*

### Adjusting track panning trim levels

1. Deselect the **Automation Settings** button ( ).
2. Drag the **Pan** slider to control the position of the track in the stereo field. Dragging to the left will place the track in the left speaker more than the right, and dragging to the right will place the track in the right speaker.

   You can hold Ctrl while dragging the slider to adjust the setting in finer increments, or double-click the slider to return it to 0.

   If multiple tracks are selected, all selected tracks are adjusted.

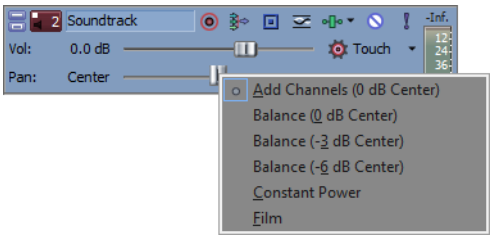
### Adjusting the track panning automation level

When you select the **Automation Settings** button ( ), the **Pan** slider handle is displayed with an automation icon ( ), and you can use the control to edit pan automation. *For more information, see Volume or pan automation (audio only) on page 164.*

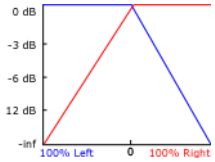
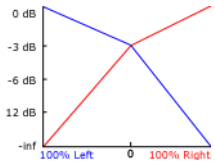
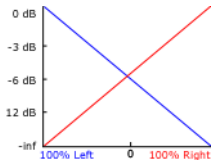
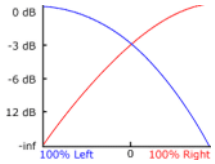
### Changing the pan mode

Right-click the slider handle and choose a pan type to change the behavior of the **Pan** slider.

**Note:** *The selected panning mode is also used for track-level pan envelopes. For more information, see Volume or pan automation (audio only) on page 164.*



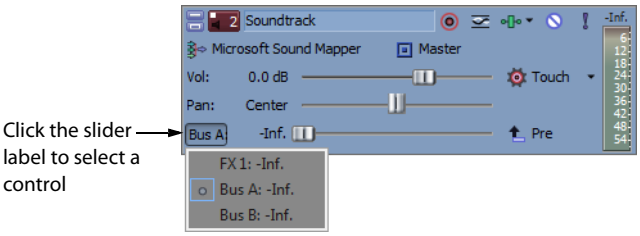

| Item | Description |
|---|---|
| **Add Channels** | This mode is most useful for panning stereo files. As you pan across the stereo field, the stereo image appears to move across the speakers. As you pan toward either side, the signal from the opposite channel is added to the channel you are panning toward until at the extreme both channels are sent to a single channel at full volume.<br>This mode uses a linear panning curve.<br>**Important:** *You can introduce clipping when channels are added. Monitor the meters in the Mixer and adjust the track volume accordingly.* |

| Item | Description |
|---|---|
| **Balance (0 dB Center)**<br>**Balance (-3 dB Center)**<br>**Balance (-6 dB Center)** | In a stereo project, this mode can help you adjust the relative signal levels of the channels in stereo source material. As you pan from the center to either side, the opposite channel begins at the specified center value (0 dB -3 dB, or -6 dB), and decays to -infinity. The signal in the side you are panning toward progresses from the specified center value (0 dB, -3 dB, or -6 dB) to 0 dB.<br>This panning mode uses a linear panning curve.<br>For example, when you pan fully right, the right channel is played at 0 dB and the left channel is not audible. As you pan to the center, each channel is attenuated to the specified center value (0 dB -3 dB, or -6 dB). As you pan to the left, the left channel is played at 0 dB, and the right channel is not audible.<br>  <br><br>With the **Balance (0 dB center)** setting, no gain or cut is applied when you're panned to the center, which can make the center seem louder.<br>  <br><br>With the **Balance (-3 dB center)** setting, a -3 dB cut is applied when you're panned to the center.<br>  <br><br>With the **Balance (-6 dB center)** setting, a -6 dB cut is applied when you're panned to the center.<br>Panning in a 5.1 surround project follows the same rules: as you pan from the center to any channel in a 5.1 surround project, the signal in the channel you are panning toward progresses from the specified center value to 0 dB. The signal in the channel you are panning away from begins at the specified center value and decays to -infinity. |
| **Constant Power** | This mode is most useful for panning monaural source material. In this mode, sound will maintain its volume when you pan across channels.<br>If you pan a stereo file 100% R, only the right channel of your media file is played, and this channel is sent to both output channels. If you continue to pan to the left, the left channel is gradually added to the output, and the right channel is gradually faded out until only the left channel will be heard through both output channels when the slider is at 100% L.<br>  <br><br>If you pan a file fully right midway between the front and rear channels in a 5.1 surround project, only the right channel of your media file is played, and this channel is sent to the right-front and -rear output channels. If you pan to the left, the left channel is gradually added to the output, and the right channel is gradually faded out until only the left channel is sent to the left-front and -rear output channels. |

| Item | Description |
|---|---|
| **Film** | This mode allows you to pan between pairs of adjacent speakers in 5.1 surround projects using a constant power model. This mode is optimized for theater-style speaker placement. In stereo projects, Film mode functions identically to Constant Power.<br>As you drag the pan point to the center speaker, the sound becomes diffused through the front and rear speakers. When the track is panned fully to the center speaker, there is no output from the front and rear speakers.<br>Dragging the pan point to the center of the surround panner sends the signal to all speakers.<br>**Note:** *If you're panning fully to a single speaker, you might notice that some signal is mixed to the opposite speaker. This is because the ideal placement for surround speakers does not match the representation in the surround panner. For example, panning to the front-left speaker produces a low-level signal in the rear-left speaker.*<br>*This is because your front-left speaker should be positioned 30° left of center and the speaker in the surround panner is located 45° left of center. To produce a true 45° left-of-center pan, the signal is panned between the front- and rear-left speaker.* |

### Using the multipurpose slider (audio only)

This slider controls bus send levels and assignable effects send levels. The options for the multipurpose slider depend on what your project contains (for example, busses and assignable effects). You can select what the slider controls by clicking the slider label. Each item's slider position is independent from the others.



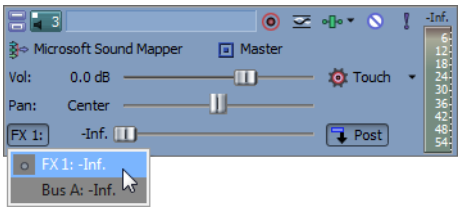

**Tips:**

- *If you do not see this slider on a track, increase the track height. For more information, see Resizing a track on page 150.*
- *You can move the slider by pressing Shift+the right or left arrow keys.*

### Assigning audio tracks to assignable effects chains

Assignable effects chains are made up of one or more plug-ins that are used to add audio effects to a track's signal. You can adjust the level of a track that is sent to an assignable effects chain using the multipurpose slider in the track list. The multipurpose slider can function as a trim control that adjusts the overall assignable effects send level for the track, or it can adjust assignable effects automation settings. *For more information, see Adjusting assignable effects automation levels on page 165.*

1. Deselect the **Automation Settings** button ( ).
2. Click the label on the multipurpose slider to display a drop-down list.
3. Choose the assignable effects chain that the track will use.



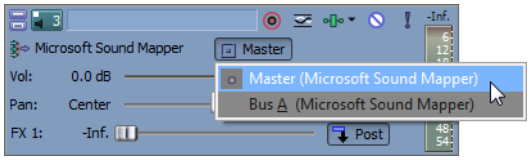
4. Drag the slider to adjust the level of the track sent to the assignable effects chain.

**Note:** *Assignable effect sends are post-volume by default. To change to pre-volume, click the* **Pre/Post Volume Send** *button (Pre).*

### Assigning audio tracks to busses

If your project contains multiple busses, you can assign a track to a specific bus.

1. Click the **Bus** button ( ) in the track list to display a drop-down list of available busses.
2. From the drop-down list, choose the bus for the track's output.

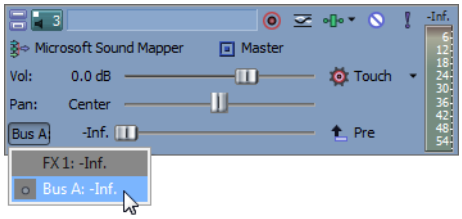



Select a bus for playback

### Adjusting bus send levels

When a track is routed to a bus, you can control the level of tracks sent to the bus using the multipurpose slider. The multipurpose slider in the track header can function as a trim control that adjusts the overall send level of the track, or it can adjust bus send automation settings. *For more information, see Adjusting bus automation levels on page 166.*

1. Deselect the **Automation Settings** button ( ).
2. Click the label on the multipurpose slider and choose a bus from the menu.




3. Drag the fader to control the level of the track sent to each of the additional busses that you have created. Dragging the fader to the left cuts the volume; dragging to the right boosts the volume.

   You can hold Ctrl while dragging a fader to adjust the setting in finer increments, or double-click the fader to return it to 0 dB.

   If multiple tracks are selected, the trim level of all selected tracks is adjusted.

**Note:** *Bus sends are pre-volume by default. To change to post-volume, click the* **Pre/Post Volume Send** *button (Pre).*

*For more information, see Adjusting bus send levels on page 208 or Assigning audio tracks to assignable effects chains on page 154.*

### Adjusting the composite level (video only)

The **Level** slider in the track header determines the opacity of the video track. The slider can function as a trim control that adjusts the overall opacity of the track, or it can adjust track composite level automation settings. *For more information, see Adjusting the composite level automation settings on page 169.*

The trim level is added to the composite level automation settings so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 percent has the same effect as decreasing every envelope point by 3 percent.

1. Deselect the **Automation Settings** button ( ).
2. Drag the slider to control the transparency or blending of each track. Left is 100 percent transparent and right is 100 percent opaque. You can also double-click the percent to enter a specific value.

### Selecting the compositing mode

Click the **Parent Composite Mode** or **Compositing Mode** button and choose a mode from the menu to determine how the transparency in a video track is generated. Since lower tracks show through higher tracks, it is the compositing mode of the higher track that determines how much of the lower track shows though. The compositing mode of the lowest video track adjusts its transparency against the background.

*For more information, see Compositing on page 306.*

### Bypassing motion blur envelopes (video only)

If you applied a motion blur envelope to your video bus track, this envelope affects all tracks. You can select specific tracks to bypass this envelope by clicking a track's **Bypass Motion Blur** button ( ). *For more information on motion blur envelopes, see Adding a motion blur envelope on page 170.*

### Using track motion (video only)

Use the **Track Motion** button ( ) to move a video track over another track (that is, picture-in-picture). *For more information on adding track motion, see Adding track motion on page 339.*

### Phase inverting a track (audio only)

The **Invert Track Phase** button ( ) inverts the audio track at its baseline, in effect reversing its polarity. Inverting a track, while creating little audible difference, is occasionally useful for matching transitions when mixing audio on separate tracks or fine-tuning a crossfade.

You can also phase invert an audio event. If an event on a track is inverted and you invert the track, the event is doubly-inverted (restored to its original state). *For more information, see Invert phase (audio only) on page 180.*

### Muting a track

The **Mute** button ( ) in the track list temporarily suspends playback of the track so that you can focus on another track. When a track is muted, it appears grayed out on the timeline. You can mute more than one track at a time. The **Mute** button can mute a track or change its mute automation state. *For more information, see* *Mute automation (audio and video) on page 163*.

> **Note:** *Muting a track mutes its main output and post-fader sends only unless the* **Track prefader sends listen to mute** *check box on the* **Audio** *tab of the Preferences dialog is selected.*

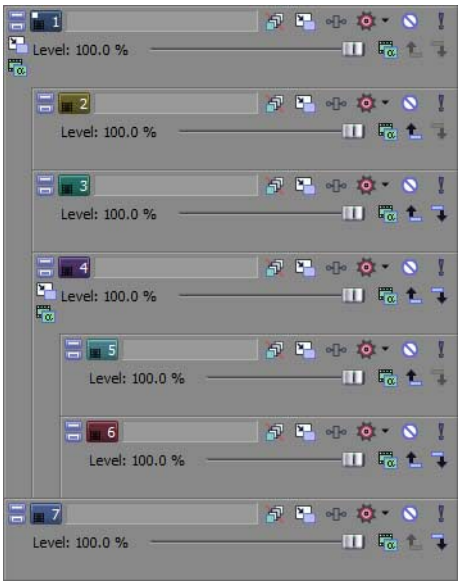
To mute a track, deselect the **Automation Settings** button ( ). Next, click the **Mute** button.

To mute several tracks, select the tracks and click the **Mute** button on any of the selected tracks. Click the **Mute** button again to restore the tracks.

> **Tip:** *Press Ctrl and click the* **Mute** *button to mute only the selected track (and restore any other muted tracks). If the selected track is already muted, press Ctrl and click the* **Mute** *button to restore all tracks.*

When you have multiple levels of parent and child tracks, clicking the **Mute** button on a parent track mutes the parent track and its compositing children.

In the sample track list, muting track 1 will mute tracks 1 through 6. Muting track 4 will mute tracks 4 through 6.




#### Muting all audio or video tracks

You can mute either all audio or all video tracks in a project. From the **Options** menu, choose **Mute All Audio** or **Mute All Video**.

#### Muting a track group

Click the **Mute Track Group** button ( ) in a track group header to temporarily suspend playback of all tracks in the group. Muting a track group overrides soloed tracks in the group.

Click the **Mute Track Group** button again to restore the track group for playback.

### Soloing a track

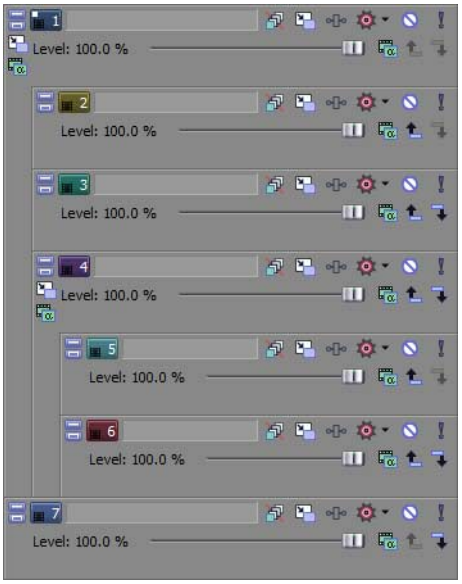
The **Solo** button ( ) in the track list isolates a track's events for playback. This allows you to focus on a track's contents without the distraction of other tracks. You can solo more than one track at a time.

To solo a track, click the **Solo** button on that track. To solo several tracks, select the tracks and click the **Solo** button on any of the selected tracks. Click the **Solo** button again to restore the track(s) for playback.

> **Tip:** *Press Ctrl and click the* **Solo** *button ( ) to solo only the selected track (and restore any other soloed tracks). If the selected track is already soloed, press Ctrl and click the* **Solo** *button to restore all tracks.*

When you have multiple levels of parent and child tracks, clicking the **Solo** button on a parent track solos the parent track and its compositing children. Other nonsoloed tracks at the same compositing level are bypassed.

In the sample track list, soloing track 1 will solo tracks 1 through 6. Soloing track 4 will solo tracks 4 through 6. Tracks 2 and 3 are bypassed, and tracks 1 and 7 play normally.




### Soloing a track group

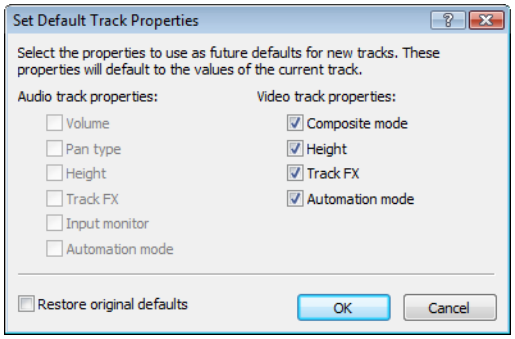
Click the **Solo Track Group** button ( ) in a track group header to isolate all tracks in the group for playback. Soloing a track group overrides muted tracks in the group.

Click the **Solo Track Group** button again to restore the track group for playback.

## Setting default track properties

You can use the settings of a selected track to determine the default settings for all new tracks in your project. Properties that can be set appear in the Set Default Track Properties dialog.

1. Set up a track in your project with the properties to use as default settings for new tracks.
2. Right-click the track number and choose **Set Default Track Properties**. The Set Default Track Properties dialog appears.




3. Select the check boxes that you want to set as defaults.
4. Click **OK**.

Any new tracks created in the project will have these defaults. To return to the original settings for new tracks, select the **Restore original defaults** check box in the Set Default Track Properties dialog.

## Track automation envelopes

Track automation envelopes allow you to control volume, audio panning, opacity, and fade to color effects of a particular track over time. *For more information, see Working with track envelopes on page 171.*

## Using audio bus tracks

From the **View** menu, choose **Audio Bus Tracks** to toggle the display of audio bus tracks at the bottom of the timeline. An audio bus track exists for each bus or assignable effects chain in your project and serves as a timeline representation of each bus or assignable effects chain.

You can use bus tracks to automate volume, panning, and effect parameters using envelopes. *For more information, see Bus automation (audio only) on page 166.*

### Adding envelopes to an audio bus track

Adding volume, panning, and effect automation envelopes to a bus track is just like adding an envelope to a standard track. *For more information, see Composite level automation (video only) on page 169.*

### Adding effects to audio bus tracks

Click the **Bus FX** button ( ) in the bus track header to add or edit bus effects. If there are no effects on the bus, clicking this button displays the Plug-In Chooser. If an audio bus already has effects assigned, clicking this button displays the Bus FX window.

Clicking this button has the same effect as clicking the button on a bus control in the Mixing Console.

If the bus effects chain includes plug-ins with automatable parameters, the **Bus FX** button is displayed with a drop-down arrow button ( ).

*For more information, see Adding bus effects on page 230.*

### Muting or soloing an audio bus track

Click the **Mute** ( ) or **Solo** ( ) button in the bus track header to mute or solo a bus.

Clicking these buttons on a bus track has the same effect as clicking the buttons on a bus control in the Mixer window.

### Resizing audio bus tracks

You can drag the horizontal splitter between the track list and bus tracks to increase or decrease the space allocated to bus tracks. Perform any of the following actions to resize individual bus tracks:

- Drag a bus track's bottom border to set its height.
- Click the **Minimize** button ( ) to minimize a track vertically.
- Click the **Maximize** button ( ) to zoom in vertically so a bus track fills the lower portion of the timeline.
- After minimizing or maximizing a bus track, click either button again to return a bus track to its previous height.
- Press Ctrl+Shift+Up Arrow/Down Arrow when the bus track area has focus to resize all bus tracks at once.

## Using video bus tracks

From the **View** menu, choose **Video Bus Track** to toggle the display of the video bus track at the bottom of the timeline. A single bus track exists as a timeline representation of the main video output.

You can use bus tracks to animate video output effects using keyframes, add motion blur envelopes, or video supersampling envelopes.

### Adding keyframes to the video bus track

Adding keyframes to the video bus track is just like working with any other video track. Use video bus track keyframes to animate video output effects. *For information on adding keyframes, see Using keyframe animation on page 330.*

### Adding envelopes to the video bus track

You can add fade-to-color, motion blur amount, and video supersampling envelopes to the video bus track to affect your video output. *For more information, see Working with track envelopes on page 171.*

### Adding effects to video bus tracks

Click the **Video Output FX** button ( ) in the bus track header to add or edit video output effects. If there are no video output effects, clicking this button displays the Plug-In Chooser. If you've already set up video output effects, clicking the button displays the Video Output FX window.

### Muting the video output

Click the **Mute** button ( ) in the bus track header to mute all video output.

### Bypassing video effects and envelopes

Click the **Bypass FX and Envelopes** button ( ) in the bus track header to bypass all video output effects and bus track envelopes.

### Resizing video bus tracks

You can drag the horizontal splitter between the track list and bus tracks to increase or decrease the space allocated to bus tracks. Perform any of the following actions to resize individual bus tracks:

- Drag a bus track's bottom border to set its height.
- Click the **Minimize** button ( ) to minimize a track vertically.
- Click the **Maximize** button ( ) to zoom in vertically so a bus track fills the lower portion of the timeline.
- After minimizing or maximizing a bus track, click either the **Minimize** or **Maximize** button again to restore a bus track to its previous height.
- Press Ctrl+Shift+Up Arrow/Down Arrow when the bus track area has focus to resize all bus tracks at once.

## Rendering to a new track

From the **Tools** menu, choose **Render to New Track** to mix multiple tracks to a single track. This function is similar to track bouncing in the analog world.

**Tip:** *When your project contains many tracks and effects, mixing down can help conserve processing power.*

When you render multiple tracks, any envelope or track effects that you have applied will be rendered into the new track. The original source files remain unaffected, and the new track(s) will be saved to a new file.

1. Click the **Solo** button ( ) for the tracks that you want to mix down. If no tracks are soloed, the rendered track will match the Master Bus output. Create a time selection if you want to mix down a portion of your project.

   Video tracks will be rendered into a single video track, and audio tracks will be rendered into a single stereo audio track.
2. From the **Tools** menu, choose **Render to New Track** or press Ctrl+M. The Render As window is displayed.
3. Use the controls in the Render As window to choose the location and format you want to use to save your rendered track. For more information about the Render As window, see *Rendering a project on page 363*.
4. Click the **Render** button. A window is displayed to show rendering progress.
5. When the mixing is complete, the new track appears in the track list.
6. After the new track appears, you may delete the original tracks.

Chapter 9

# Using Automation

Automation allows you to control audio and video levels, panning, and effect parameter automation over time. You can create fades, apply stereo panning, and vary effect parameters throughout your project. Automation is represented on the Vegas® Pro timeline as an envelope or set of keyframes. You can create automation by adding envelopes or keyframes to your tracks (including bus tracks), or you can record automation parameters by adjusting controls in the Vegas Pro interface (or on a control surface) during playback.

**Important:** *Gain, level, and panning controls can adjust automation (dynamic) settings, or they can function as trim (nonautomated) controls.*

*The trim setting is added to the automation settings so your envelope or keyframe values are preserved, but with an offset applied. For example, setting an audio track's trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.*

*If your automation is not behaving as expected, you might have applied a trim value that is offsetting your automation settings.*

*When a control is set to adjust trim levels, its handle is displayed as a ( ). When a control is set to adjust automation levels, it is displayed with an automation icon ( ).*

## Showing or hiding automation controls

The controls in the track list can function as trim controls or automation controls for track volume, panning, assignable effects send, and bus send levels. Adjusting the trim control affects the level of the entire track.

To display trim controls in the track header, select the **Automation Settings** button ( ).

## Track automation

Track automation will always affect all events on the track. This means that any event envelopes will be calculated after the track automation.

**Tip:** *Choose a fade type from the* **Audio default** *drop-down list on the* **Editing** *tab of the Preferences dialog to set the default fade type that will be used when you add volume and panning envelopes. This setting is used only when you create new envelopes—when you add a point to an existing envelope, the new point always uses the same fade type as the preceding envelope point. Also, this setting is not used for event envelopes.*

### Mute automation (audio and video)

Mute automation changes a track's mute state throughout your project. Mute automation is either on or off with no fade between. If you want to use fades, apply volume automation.

When you apply mute automation to a track, it's possible to have a track that is muted and soloed simultaneously. The mute state overrides the solo state:

- If a track's **Solo** button is selected, the track is included in the solo group, but it will be muted whenever the mute automation is set to mute the track.
- If the track's **Mute** button is selected, the track is muted regardless of the mute automation settings.

#### Adding or removing mute automation

1. Select a track.
2. From the **Insert** menu, choose **Audio Envelopes** or **Video Envelopes**, or right-click in the track list and choose **Insert/Remove Envelope** from the shortcut menu.
3. From the submenu, choose **Mute**. A check mark is displayed next to the command, and an envelope is added to the timeline.
4. You can adjust the automation by editing the envelope in the timeline or by using the **Mute** button ( ) in the track header when the **Automation Settings** button ( ) is selected.

#### Adjusting mute automation settings

1. Select the **Automation Settings** button ( ). The **Mute** button is displayed with an automation icon ( ).
2. Click the **Mute** button to change the track's mute automation state.

   The button behaves differently depending on the track automation recording mode:

   - When the track automation mode is set to **Off**, the button mutes the entire track.
   - When the track has a mute envelope and the track automation mode is set to **Read**, the button changes state to reflect the envelope setting during playback but cannot be adjusted.
   - When the track has a mute envelope and the track automation mode is set to **Touch** or **Latch**, the button edits the envelope setting at the cursor position.

   If you click the **Mute** button ( ) during playback, the behavior varies depending on the selected automation recording mode. *For more information, see Automation recording modes on page 176.*

### Volume or pan automation (audio only)

You can change a track's volume or position in the stereo field throughout a project using automation envelopes.

#### Adding or removing volume or pan automation

1. Select an audio track.
2. From the **Insert** menu, choose **Audio Envelopes**, or right-click in the track list and choose **Insert/Remove Envelope** from the shortcut menu.
3. From the submenu, choose **Volume** or **Pan**. A check mark is displayed for the automation types that are used on the selected track.

> **Note:** *Panning envelopes will use the current panning mode for the* **Pan** *slider in the track list.*

4. If you want to change the track's volume or pan setting throughout the track, edit the envelope in the timeline.

#### Adjusting volume or pan automation settings

1. If you want to change volume or pan settings by recording automation, select the **Automation Settings** button ( ). The fader/slider handle is displayed with an automation icon ( ) in automation mode.
2. Drag the **Vol** fader to control how loud a track is in the mix or drag the **Pan** slider to control the position of the track in the stereo field.

   The fader and the slider behave differently depending on the track automation recording mode:

   - When the track automation mode is set to **Off**, the fader adjusts the volume of the entire track and the slider pans the entire track. In this mode, the automation control acts as a second trim control.
   - When the track has a volume envelope and the track automation mode is set to **Read**, the fader/slider will follow the envelope during playback but cannot be adjusted.
   - When the track automation mode is set to **Touch** or **Latch**, the fader/slider edits the envelope setting at the cursor position. If the track does not have a volume/pan envelope, an envelope will be added when you adjust the fader/slider.

If multiple tracks are selected, all selected tracks are adjusted.

If you adjust the fader/slider during playback, the behavior varies depending on the selected automation recording mode. *For more information, see* *Automation recording modes on page 176*.

## Assignable effects automation (audio only)

You can use assignable effects automation to vary the level of a track sent to an assignable effects chain.

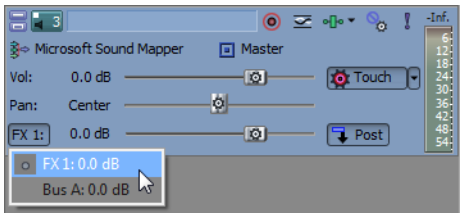
### Adding or removing assignable effects automation

Before you can add an assignable effects envelope, you'll need to add an assignable effects chain to your project. *For more information, see* *Adding assignable effects on page 231*.

1. Select an audio track.
2. From the **Insert** menu, choose **Audio Envelopes**, or right-click in the track list and choose **Insert/Remove Envelope** from the shortcut menu.
3. From the submenu, choose the effects chain where you want to send the selected track. A check mark is displayed for each assignable effects chain that is automated for the selected track.

### Adjusting assignable effects automation levels

1. Select the **Automation Settings** button ( ). The fader handle is displayed with an automation icon ( ) in automation mode.
2. Click the label on the multipurpose slider and choose an assignable effects chain from the menu.




3. Drag the FX fader to control the level of the track sent to each of the assignable FX chains that you have created.

   The fader behaves differently depending on the track automation recording mode:

   - When the track has an assignable effects envelope and the track automation mode is set to **Off**, the fader adjusts the send level of the entire track. In this mode, the automation control acts as a second trim control.
   - When the track has an assignable effects envelope and the track automation mode is set to **Read**, the fader will follow the envelope during playback but cannot be adjusted.
   - When the track has an assignable effects envelope and the track automation mode is set to **Touch** or **Latch**, the fader edits the envelope setting at the cursor position. If the track does not have an envelope, one will be created when you adjust the fader.

If multiple tracks are selected, all selected tracks are adjusted.

If you adjust the fader during playback, the behavior varies depending on the selected automation recording mode. *For more information, see* *Automation recording modes on page 176*.

**Tips:**

- *FX sends are post-volume by default. To change to pre-volume, right-click the FX fader and choose* **Pre Volume** *from the shortcut menu.*
- *If you want to apply track panning (including pan position and panning mode) to FX sends, right-click the FX fader and choose* **Link to Main Track Pan** *from the shortcut menu. When* **Link to Main Track Pan** *is not selected, the track sends a center-panned stereo signal using the track's current panning mode.*
- *Select the* **Use legacy track send gain** *check box on the* **Audio** *tab of the Preferences dialog if you want to configure audio track sends to behave as they did in Vegas Pro 7.0 and earlier. When the check box is selected, you can open projects created with earlier versions of Vegas Pro and be assured they will sound the same as they did in earlier versions of Vegas Pro.*

## Bus automation (audio only)

You can use bus automation envelopes to vary the level of a track sent to a bus.

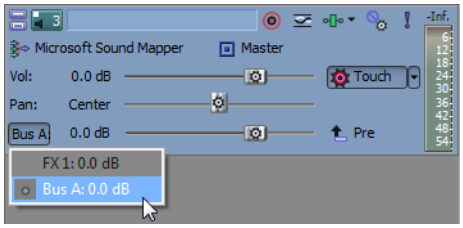
### Adding or removing a bus automation envelope

Before you can add a bus envelope, you'll need to specify the number of busses for your project.

1. Select an audio track.
2. From the **Insert** menu, choose **Audio Envelopes**, or right-click in the track list and choose **Insert/Remove Envelope** from the shortcut menu.
3. From the submenu, choose the bus where you want to send the selected track. A check mark is displayed for each bus send level that is automated for the selected track.

### Adjusting bus automation levels

1. Select the **Automation Settings** button ( ). The fader handle is displayed with an automation icon ( ) in automation mode.
2. Click the label on the multipurpose slider and choose a bus from the menu.




3. Drag the fader to control the level of the track sent to each of the assignable FX chains that you have created. Dragging the fader to the left cuts the volume; dragging to the right boosts the volume.

   The fader behaves differently depending on the track automation recording mode:

   - When the track automation mode is set to **Off**, the fader adjusts the send level of the entire track. In this mode, the automation control acts as a second trim control.
   - When the track has a bus envelope and the track automation mode is set to **Read**, the fader will follow the envelope during playback but cannot be adjusted.
   - When the track has a bus envelope and the track automation mode is set to **Touch** or **Latch**, the fader edits the envelope setting at the cursor position. If the track does not have an envelope, one will be created when you adjust the fader.

If multiple tracks are selected, all selected tracks are adjusted.

If you adjust the fader during playback, the behavior varies depending on the selected automation recording mode. *For more information, see* *Automation recording modes on page 176*.

**Tips:**

- *Bus sends are pre-volume by default. To change to post-volume, right-click the bus fader and choose* **Post Volume** *from the shortcut menu.*
- *If you want to apply track panning (including pan position and panning mode) to bus sends, right-click the bus fader and choose* **Link to Main Track Pan** *from the shortcut menu. When* **Link to Main Track Pan** *is not selected, the track sends a center-panned stereo signal using the track's current panning mode.*

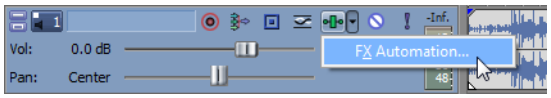
## Effect automation (audio only)

When you add an effect that supports automation, you can use automation to dynamically adjust effect parameters.

Automation for audio track effects is applied on the audio track. Automation for bus effects and assignable effects is applied on the appropriate bus track. *For more information, see* *Adding audio track effects on page 229*, *Adding bus effects on page 230*, *and Adding assignable effects on page 231*.

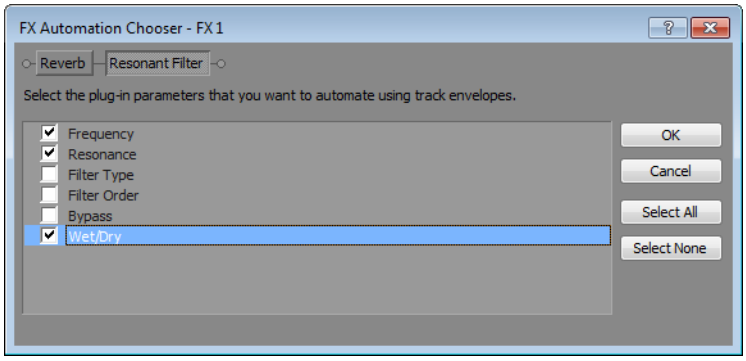
### Adding effect automation

1. Click the down arrow next to the **Track FX** button ( ) and choose **FX Automation** to display the FX Automation Chooser.




> **Note:** *If no track effects exist, clicking the* **Track FX** *button will display the Plug-In Chooser. Effects that can be automated are indicated by the red icon ( ) in the chooser. The first time you select a plug-in, the application will determine whether it can be automated and will update the plug-in's icon and add it to the* **Automatable** *folder in the Plug-In Chooser.*

2. Click an effect button at the top of the FX Automation Chooser. A list of the effect's automatable parameters is displayed:




3. Select the check box for each parameter that you want to control with an envelope. You can use the **Select All** and **Select None** buttons to quickly change your selections to all or none of the parameters.

> **Tip:** *If you're working with a 5.1 surround project, you can select the* **Enable** *check boxes to determine which channels will be affected by the plug-in. An automation envelope is added to the timeline for each selected channel so you can enable or bypass the plug-in during the project.*
>
> *If you want to use distinct plug-in settings for each channel (separate EQ settings for the front and surround speakers, for example), you can add multiple instances of the plug-in to the track effects chain and select the* **Enable** *check boxes for the channels you want each instance of the plug-in to affect.*

4. Click **OK** to close the FX Automation Chooser. An envelope is added to the track for each parameter that you selected in the FX Automation Chooser. To control which effect parameter envelopes are displayed on the track, click the down arrow next to the **Track FX** button ( ) and choose an envelope from the menu.

> **Tip:** *Press E to toggle through the display of all effect parameter automation envelopes.*

### Adjusting effect automation parameters

You can adjust automated effect parameters by editing the envelopes in the timeline or by recording automation with the controls in the Audio Track FX, Bus FX, or Assignable FX window.

If you've enabled the **Bypass** parameter for a plug-in, you can click the **Bypass** button in the plug-in's banner to toggle the Bypass envelope at the cursor position.

**Note:** *When you automate an effect's frequency parameter — such as the frequency parameters in the track EQ effect — you may notice that the frequency changes are more apparent when moving through the lower frequencies. This is because frequency scales in track EQ and other plug-ins use a logarithmic scale, but effect automation uses linear interpolation.*

*To make the automated frequency changes sound more natural, change the fade curve types to change the interpolation rates between envelope points. For high-to-low frequency sweeps, use a fast fade curve; for low-to-high frequency sweeps, use a slow curve. For more information, see* *Changing envelope fade curves on page 173*.

### Bypassing effect automation

Toggle the **Bypass FX Automation** button ( ) in the Audio Track FX, Bus FX, or Assignable FX window to enable or bypass automation envelopes:

- After you've added effect automation envelopes, the **Bypass FX Automation** button is deselected, and effect parameters are automated using the envelope settings.
- When the button is selected, effect automation envelopes are ignored and the effect's initial state is used for the duration of the track.
- If you delete all automation envelopes from a plug-in, the **Bypass FX Automation** button is unavailable.

### Removing effect automation

1. Click the down arrow next to the **Track FX** button ( ) and choose **FX Automation** to display the FX Automation Chooser.

**Note:** *If no track effects exist, clicking the* **Track FX** *button will display the Plug-In Chooser. Effects that can be automated are indicated by the red icon ( ) in the chooser. The first time you select a plug-in, the application will determine whether it can be automated and will update the plug-in's icon and add it to the* **Automatable** *folder in the Plug-In Chooser.*

2. Click an effect button at the top of the FX Automation Chooser. A list of the effect's automatable parameters is displayed.
3. Clear the check box for the automation you want to remove.
4. Click **OK** to close the FX Automation Chooser. The envelope is removed from the timeline for each check box that you cleared in the FX Automation Chooser.

## Composite level automation (video only)

You can use the composite level automation envelopes to adjust the opacity of a track over time.

### Adding or removing composite level automation

1. Select a video track.
2. From the **Insert** menu, choose **Video Envelopes**, or right-click in the track list and choose **Insert/Remove Envelope** from the shortcut menu.
3. Choose **Track Composite Level** from the submenu or shortcut menu.
4. You can adjust the envelope by editing the envelope in the timeline or by adjusting the slider in the track header when the **Automation Settings** button ( ) is selected.

### Adjusting the composite level automation settings

1. Select the **Automation Settings** button ( ). The slider handle is displayed with an automation icon ( ) in automation mode.
2. Drag the slider to control the transparency or blending of each track. Left is 100 percent transparent and right is 100 percent opaque. You can also double-click the percent to enter a specific value.

- When the track automation mode is set to **Off**, the slider adjusts the send level of the entire track. In this mode, the automation control acts as a second trim control.
- When the track has a composite level envelope and the track automation mode is set to **Read**, the slider will follow the envelope during playback but cannot be adjusted.
- When the track has a composite level envelope and the track automation mode is set to **Touch** or **Latch**, the slider edits the envelope setting at the cursor position. If the track does not have an envelope, one will be created when you adjust the slider.

If multiple tracks are selected, all selected tracks are adjusted. If you adjust the slider during playback, the behavior varies depending on the selected automation recording mode. *For more information, see Automation recording modes on page 176.*

## Fade-to-color automation (video only)

Fade-to-color automation is used to fade a track between two colors. It can be used to fade a track to or from black, and if applied to the top video track, you can fade the entire project.

### Adding fade-to-color envelopes

The fade color is chosen by moving the envelope towards the top or bottom of the track. You can add points to automate the fade.

1. Select a video track.
2. From the **Insert** menu, choose **Video Envelopes**, or right-click in the track list and choose **Insert/Remove Envelope** from the shortcut menu.
3. Choose **Track Fade to Color** from the submenu or shortcut menu.

   If the track already contains a fade-to-color envelope, it will be removed. If the track does not contain a fade-to-color envelope, it will be added with a setting of **No Color** (0%) for the duration of the track.
4. If you want to change the fade-to-color setting throughout the track, edit the envelope in the timeline.
5. If you want to change the fade-to-color envelope by recording automation, select the **Automation Settings** button ( ) in the track header to display automation controls. The **Fade** slider is available only in automation mode.

6. Drag the **Fade** slider.

   The slider behaves differently when you change the track automation recording mode:

   - When the track automation mode is set to **Off**, the slider adjusts the fade level of the entire track.
   - When the track automation mode is set to **Read**, the slider will follow the envelope during playback but cannot be adjusted.
   - When the track automation mode is set to **Touch** or **Latch**, the slider edits the envelope setting at the cursor position.

   *For more information about track automation recording modes, see Automation recording modes on page 176.*

#### Setting fade colors

The default fade colors are determined by the **Track fade top** and **Track fade bottom** controls on the **Video** tab of the Preferences dialog. *For more information, see Video tab on page 416.*

1. To change the top or bottom color for a track, right-click the track header and choose **Fade Colors** from the shortcut menu.
2. Choose **Top** or **Bottom** from the submenu. A color picker is displayed.
3. Use the color picker to specify the new color.
4. Click **OK**.

### Adding a motion blur envelope

Motion blur can help you make computer-generated animation look more realistic. For example, if you use track motion or event pan/crop to move a clip across the frame, each frame is displayed clearly when no motion blur is applied. Turning on motion blur adds a motion-dependent blur to each frame to create the appearance of smooth motion in the same way a fast-moving subject is blurred when you take a photograph with a slow shutter speed.

**Note:** *Motion blur significantly increases your rendering time. Adjust the envelope to apply motion blur only where necessary.*

1. Right-click the video bus track, choose **Insert/Remove Envelope** from the shortcut menu, and then choose **Motion Blur Amount** from the submenu.
2. Add and adjust envelope points as necessary to set the time interval that will be used for blurring. Increasing the value emphasizes the blur effect. For example, setting the envelope to 0 means no blurring will occur; setting the envelope to 1 second means that each frame will be blurred for one-half second before and after the frame.
3. The motion blur envelope affects all tracks. To bypass motion blur for a track, select the **Bypass Motion Blur** button ( ) in the track header.
4. To change blur type, choose a setting from the **Motion blur type** drop-down list on the **Video** tab in the Project Properties dialog. This setting determines the shape of the blur and the opacity of the frames.

### Adding a video supersampling envelope

Video supersampling can improve the appearance of computer-generated animation by calculating intermediate frames between the project's frame rate, allowing you to create smoother motion blurring or motion from sources such as track motion, event pan/crop, transitions, or keyframable effects.

**Note:** *The effect of video supersampling is less apparent with video that contains fast motion, and supersampling cannot improve the appearance of existing video.*

1. Right-click the video bus track, choose **Insert/Remove Envelope** from the shortcut menu, and then choose **Motion Blur Subsampling** from the submenu.

2. Add and adjust envelope points as necessary to indicate how many frames will be calculated between frames (using the project's frame rate) to create the blur.

**Note:** *Video supersampling significantly increases your rendering time. For example, when you set the video supersampling envelope to 2, Vegas Pro software renders twice as many frames as it would without supersampling. Adjust the envelope to apply supersampling only where necessary.*

## Working with track envelopes

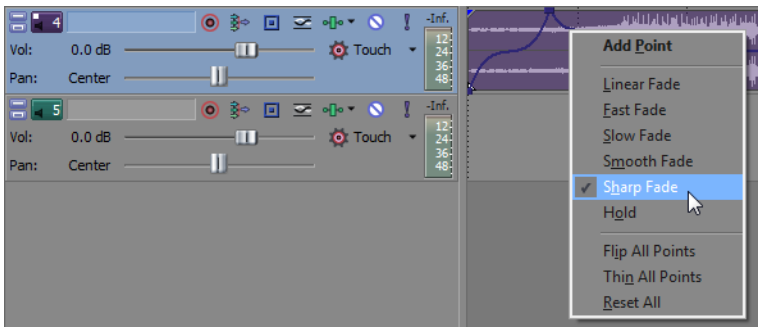
Envelopes represent volume, audio panning, opacity, and fade to color automation settings in the timeline.

| Track Type | Envelope type | Description | Color |
|---|---|---|---|
| Audio | Volume | Controls track volume. | Blue |
| Audio | Bus send volume | Controls track level sent to bus. | Lilac |
| Audio | Assignable effects send volume | Controls track level sent to assignable effects control. | Green |
| Audio | Pan | Controls the position of a track in the stereo field (pan). | Red |
| Video | Composite level | Controls track opacity/transparency. | Blue |
| Video | Fade to color | Controls fading of a track to color. Designate a top and bottom color by right-clicking the track, choosing **Fade Colors** from the shortcut menu, and choosing **Top** or **Bottom** from the submenu. | Red |
| Video bus | Motion blur | Adds a motion-dependent blur to each frame to smooth computer-generated animation. | Lilac |
| Video bus | Video supersampling | Calculates intermediate frames between the project frame rate to create smooth motion blurring. | Rust |

### Adding envelope points

Once you add an envelope to a track, you can add points to it. These points are used to edit the envelope line in order to automate the control.

1. Place the mouse pointer on the envelope's line. The pointer changes to a hand icon ( ).
2. Right-click and choose **Add Point** from the shortcut menu or double-click to add an envelope point. A square point appears on the envelope line.




**Tip:** *You can use ripple editing to automatically move envelope points as you edit in the timeline. For more information, see* *Applying post-edit ripples on page 87*.

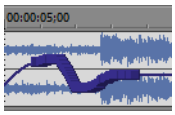
### Drawing envelope points

To create an envelope quickly, you can draw freehand envelope curves in the timeline.

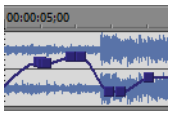
1. With the Normal Edit ( ) or Envelope ( ) tool active, hover over an envelope.
2. Hold Shift, and then click and drag over the envelope. As you drag, a trail of envelope points is created.

3. Release the mouse button when you're finished drawing.

   If the **Smooth and thin automation data after recording or drawing** check box is selected on the **External Control & Automation** tab of the Preferences dialog, the number envelope points will be reduced when you release the mouse.




Unthinned envelope




Thinned envelope

### Thinning envelope points

Thinning envelope points decreases the number of points on an envelope while retaining the envelope's overall settings. Right-click an envelope and choose **Thin All Points** from the shortcut menu to thin the entire envelope.

To apply thinning to a section of the envelope, create a time selection, right-click the envelope, and then choose **Thin Selected Points** from the shortcut menu.

**Note:** *Thinning is intended to reduce the number of envelope points created through automation recording and will have little or no effect if you create envelopes by adding and editing points manually.*

### Deleting envelope points

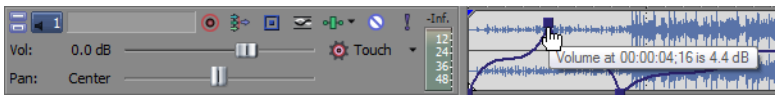
You can delete a point by right-clicking it and choosing **Delete** from the shortcut menu. If you want to delete all envelope points, right-click a point and choose **Reset All** from the shortcut menu.

### Moving envelope points

Once you have added envelope points, you can raise and lower them to different levels along the timeline, or you can adjust the envelope's location along the timeline by dragging it right or left. You can move one point at a time, even during playback and check the results in real time. If snapping is enabled, the envelope point snaps to time divisions as you drag. Hold Shift while dragging to override snapping.

**Tip:** *You can move multiple envelope points at once using the Envelope Edit tool. For more information, see* *Using the Envelope Edit tool on page 174*.

1. Place the mouse pointer on an envelope point. The pointer changes to a hand icon ( ).
2. Drag the point to the desired position. As you move an envelope point, a ToolTip displays both the point's location on the timeline and its decibel level/percent pan.




3. Click the **Play** ( ) or **Play From Start** ( ) button to play the project and check the timing of the envelope.

**Tip:** *You can also set the value of the point by right-clicking an envelope point and choosing a setting from the shortcut menu.*

### Changing envelope fade curves

You can set the type of fade curve used after each envelope point: linear, fast, slow, smooth, or sharp. You can select either a point or a portion of the envelope to set the fade curve. If you select a portion of the envelope, the fade curve is applied to that envelope segment. If you select a point, the fade curve is applied to the segment of the envelope after the selected point.

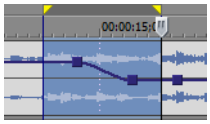
1. Right-click a point or a portion of the envelope to display a shortcut menu.
2. From the shortcut menu, choose the curve type.

**Tip:** *If you use the same fade curve frequently, you can set it as a default all new audio or video envelopes. For more information, see* *Editing tab on page 427*.

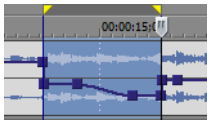
### Applying envelope fades within a time selection

When you drag an envelope within a time selection, all envelope points within the selection are adjusted, and a fade can be applied to the beginning and end of the selection to smooth the transition.

1. Create a time selection.
2. Drag an envelope point or segment within the selection. All envelope points within the selection are adjusted as you drag, and fades are applied to the beginning and end of the selection. Additional envelope points are created as necessary.



Selected envelopes



Fades are applied to the beginning and end of the selection. Additional envelope points are created as necessary.

You can use the **Editing** tab of the Preferences window to set the default length and alignment for these fades.

Clear the **Time selection envelope fades** check box on the **Editing** tab of the Preferences window if you want to edit envelope points individually. *For more information, see* *Editing tab on page 427*.

## Hiding track envelopes

After you have set your envelopes on the tracks, you can hide them from the timeline. Hiding track envelopes does not affect playback. The points that you set still automate the controls, even though the envelopes are not visible.

1. From the **View** menu, choose either **Audio Envelopes** or **Video Envelopes**. A submenu appears. Envelopes that are currently displayed are selected in the submenu.
2. From the submenu, choose an envelope name. All envelopes in your project of that type no longer appear in the timeline.

**Tip:** *From the* **View** *menu, choose* **Show Envelopes** *(or press Ctrl+Shift+E) to toggle the display of all envelopes in the timeline.*

If you've added effect automation envelopes to a track, the track can get cluttered. Click the down arrow next to the **Track FX** button ( ) and choose an envelope from the drop-down list to select which envelope you want to display.

## Removing track envelopes

When an envelope is removed, the events on the track no longer have automated control and the envelope line no longer displays.

1. Select the track(s) from which you want to remove envelopes.
2. From the **Insert** menu, choose either **Audio Envelopes** or **Video Envelopes**. A submenu appears. Envelopes that are currently displayed are selected.
3. From the submenu, click an envelope name. The envelope of that type is removed from the selected track.

Alternatively, right-click an empty area of a track, choose **Insert/Remove Envelope** from the shortcut menu, and choose an envelope type from the submenu to remove that envelope.

**Note:** *When you remove a track envelope from a track and then add it again, all points are reset.*

## Using the Envelope Edit tool

You can also edit envelope points using the Envelope Edit tool. To use this tool, click the **Envelope Edit Tool** button ( ). The advantage of switching to this tool to edit envelopes is that events cannot be moved when this tool is selected, thereby protecting them from changes. This effectively locks all of the events and effects in a project while you modify envelopes.

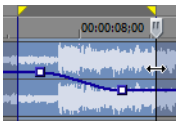
### Selecting and adjusting envelope points

1. Select the **Envelope Edit Tool** button ( ).
2. Click within a track to select it.
3. Drag along the timeline to select envelope points.
4. Drag the selected envelope points to a new position.

To deselect envelope points, click anywhere in the event that is not part of the envelope.

### Cutting, copying, and pasting envelope points

1. Select the **Envelope Edit Tool** button ( ).
2. Select the envelope points you want to cut or copy:
   a. Create a time selection that contains the envelope points you want to cut or copy.




   b. Click the envelope you want to cut or copy.

**Tip:** *If the envelope isn't displayed, you can right-click the track, choose* **Show Envelopes** *from the shortcut menu, and then choose an envelope from the submenu.*

3. From the **Edit** menu, choose **Cut** or **Copy**.
4. Select the envelope where you want to paste the envelope points:
   a. Click within a track to select it.
   b. Insert an audio or video envelope if needed.
   c. Click to select the envelope where you want to paste the selected points.
   d. Click to position the cursor where you want the envelope to start.
5. From the **Edit** menu, choose **Paste**. The envelope points are pasted on the track.

### Copying an envelope to another track

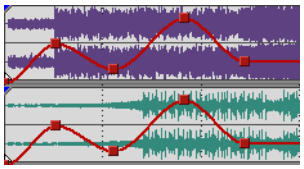
1. Select the **Envelope Edit Tool** button ( ).
2. Select the envelope you want to copy:
   a. Double-click above the time ruler to create a selection that matches the length of your project.
   b. Click the envelope you want to copy.

> **Tip:** *If the envelope isn't displayed, you can right-click the track, choose* **Show Envelopes** *from the shortcut menu, and then choose an envelope from the submenu.*

3. From the **Edit** menu, choose **Copy**.
4. Select the envelope where you want to paste the envelope points:
   a. Click within a track to select it.
   b. Insert an audio or video envelope if needed.
   c. Click to select the envelope where you want to paste the selected points.
   d. Click the **Go to Start** button ( ) if you want the envelope to appear exactly as it was in the original track, or click to position the cursor where you want the envelope to start.
5. From the **Edit** menu, choose **Paste**. The envelope is pasted on the track.

The original envelope...

...and the newly pasted copy.

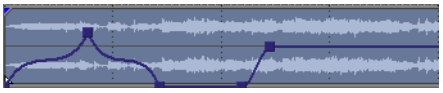


### Locking envelopes to events

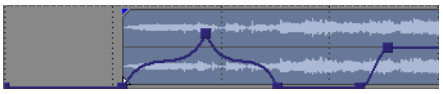
Track envelopes extend for the length of a track and are independent of the events on the track. This means that the envelope remains in place when you move the events in the track. However, track envelopes can be set to move with the underlying events, thus preserving the timing of envelope points in relation to events.

To lock all of the envelopes in a project to the events in which they occur, click the **Lock Envelopes to Events** button ( ) or, from the **Options** menu, choose **Lock Envelopes to Events**. You can turn this feature off by clicking the button again.

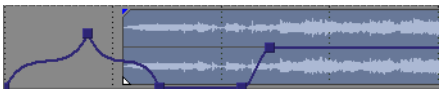
The original event



Moving the event with **Lock Envelopes to Events** turned on



Moving the event with **Lock Envelopes to Events** turned off



## Automating 5.1 surround projects

In a 5.1 surround project, you can automate the center channel's volume and surround panning using keyframes.

*For more information, see Working with 5.1 Surround on page 247.*

## Automation recording modes

Automation recording allows you to edit envelope and keyframe settings by using the controls in the Vegas Pro interface. When combined with a control surface, you can create fades and adjust control parameters with a level of control that only a tangible control can provide.

Automation recording is available for the following settings:

- Audio track envelopes (using the controls in the track header).
- Audio track effect parameters for automatable effects (using the controls in audio effects window).
- Surround panning keyframes.
- Video track envelopes (using the controls in the track header).
- Video track effect parameters (using the controls in Video Track FX window).
- Parent track overlay mode plug-in settings (using the controls in Parent Track Overlay window).
- Track-level mask generator plug-in settings (using the controls in Video Mask FX window).

**Note:** *If you want to thin envelope points after recording automation, you can select the* **Smooth and thin automation data after recording** *check box on the* **External Control & Automation** *tab of the Preferences window or right-click the envelope and choose* **Thin Points** *from the shortcut menu. For more information, see* *External Control & Automation tab on page 430*.

### Recording automation settings

1. Add an envelope or automatable/keyframeable effect to a track.

   For automatable audio track effects, you must add and effect automation envelope for each parameter you want to automate.
2. Select the **Automation Settings** button ( ) in the track header.
3. Click the down arrow next to the **Automation Settings** button and choose **Automation Write (Touch)** or **Automation Write (Latch)** from the menu.

| Automation Recording Mode | Track Icon | Description |
|---|---|---|
| **Automation Write (Touch)** | | Envelope points or keyframes are created only while a control is being adjusted. When you stop adjusting the control, automation recording stops and the existing envelope points/keyframes are unaffected. |
| **Automation Write (Latch)** | | Envelope points or keyframes are created when you change a control setting, and recording continues until you stop playback. When you stop adjusting the control, the control's current setting overwrites the existing envelope points/keyframes. |

4. Click to position the cursor in the timeline, and click the **Play** button ( ) to start playback.
5. Adjust the control that corresponds to the envelope point or keyframe you want to adjust.

   During playback, adjusting a control will create envelope points or keyframes at the cursor position. As long as you're adjusting the control, new envelope points/keyframes will be created for each change of the play cursor's position.
6. Click the **Stop** button ( ) to end playback and stop recording automation.

### Editing sections of your recorded settings in Touch mode

In Touch recording mode, envelope points or keyframes are created only while a control is being adjusted. When you stop adjusting the control, automation recording stops and the existing envelope points/keyframes are unaffected.

Use Touch mode for touching up sections of your recorded automation settings.

1. Select the **Automation Settings** button ( ) in the track header.
2. Click the down arrow next to the **Automation Settings** button and choose **Automation Write (Touch)** from the menu. The icon in the track header is displayed with an automation icon ( ).
3. Click to position the cursor in the timeline, and click the **Play** button ( ) to start playback.
4. When you're ready to start editing, adjust the control that corresponds to the envelope point or keyframe you want to adjust. Envelope points/keyframes are updated at the cursor position, and when you stop adjusting the control, the original settings are preserved.

5. Click the **Stop** button ( ) to end playback and stop recording automation.

### Overwriting recorded settings in Latch mode

In Latch mode, envelope points or keyframes are created when you change a control setting, and recording continues until you stop playback. When you stop adjusting the control, the control's current setting overwrites the existing envelope points/keyframes.

Use Latch mode to overwrite automation settings with new values.

1. Select the **Automation Settings** button ( ) in the track header.
2. Click the down arrow next to the **Automation Settings** button and choose **Automation Write (Latch)** from the menu. The icon in the track header is displayed with an automation icon ( ).
3. Click to position the cursor in the timeline, and click the **Play** button ( ) to start playback.
4. When you're ready to start editing, adjust the control that corresponds to the envelope point or keyframe you want to adjust.

   Envelope points/keyframes are updated at the cursor position until you stop playback.
5. Click the **Stop** button ( ) to end playback and stop recording automation.

### Editing individual envelope points or keyframes

Editing individual envelope points or keyframes gives you fine control over your recorded settings.

1. Select the **Automation Settings** button ( ) on the track you want to edit.
2. Click the down arrow next to the **Automation Settings** button and choose **Automation Write (Touch)** or **Automation Write (Latch)** from the menu.
3. Select the parameter you want to edit:
   - For a track envelope, select the Envelope Edit tool ( ) and click the envelope point you want to edit. You can right-click a point and choose **Properties** from the shortcut menu to display an effect's property page.
   - For a keyframe, click the **Expand/Collapse Track Keyframes** button ( ) to expand track keyframe rows, and then double-click a keyframe to open its property page. *For more information, see Applying video effects on page 301.*
4. Adjust the control that corresponds to the envelope point or keyframe you want to adjust. The selected envelope point/keyframe is edited, and all others are unaffected.

   For track envelopes, you can also edit the envelope directly in the timeline.

### Setting the automation recording mode for a track

1. Select the **Automation Settings** button ( ) in the track header.
2. Click the down arrow next to the **Automation Settings** button and choose a command from the menu to choose the automation mode.

| Mode | Track Icon | Description |
|---|---|---|
| **Off** | | Automated parameters are ignored during playback.<br>When you switch to **Off** mode, the control setting from the cursor position is used as a static setting, and the envelope/keyframe is dimmed to indicate that it is unavailable. |
| **Read** | | The envelope/keyframe value is applied during playback, and the control reflects the envelope/keyframe settings at the cursor position.<br>Adjustments to the control are not recorded. |
| **Automation Write (Touch)** | | The envelope/keyframe value is applied during playback, and the control follows the envelope/keyframe settings during playback and when you position the cursor.<br>Envelope points or keyframes are created only while a control is being adjusted. When you stop adjusting the control, automation recording stops and the existing envelope points/keyframes are unaffected. |

| Mode | Track Icon | Description |
| --- | --- | --- |
| **Automation Write (Latch)** | | The envelope/keyframe value is applied during playback, and the control follows the envelope/keyframe settings during playback and when you position the cursor.<br>Envelope points or keyframes are created when you change a control setting, and recording continues until you stop playback. When you stop adjusting the control, the control's last setting overwrites the existing envelope points/ keyframes. |

Chapter 10

# Working with Events

Events are windows into media files in a project and are the most basic unit of editing in Vegas® Pro software. Media files that are inserted into the timeline are automatically contained within an event. Trimming and editing an event does not affect the source media file in any way.

## Setting event switches

Event switches are important functions that are used to determine the basic behavior of events. You can set switches for a single event or multiple events at the same time.

1. Right-click an event.
2. From the shortcut menu, choose **Switches**, and choose the desired switch from the submenu.

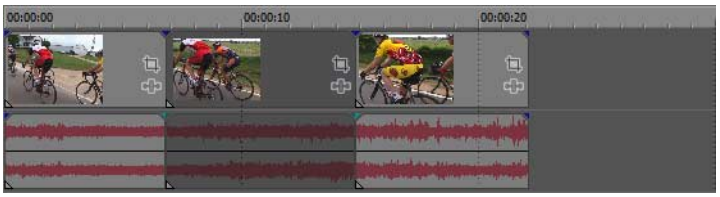
   Active switches have a check mark next to them. Choose an active switch on the menu to turn it off.

**Tip:** *You can also set switches in the* **Edit** *menu, in the Edit Details window, or by right-clicking an event and choosing* **Properties**.

### Mute

Use the Mute switch to mute an event. This prevents the event from playing back.

Muted events on muted tracks are darkened on the timeline to indicate their muted state. In the following example, the middle events are muted:

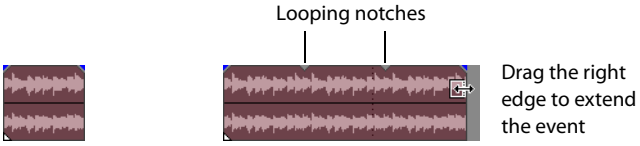



### Lock

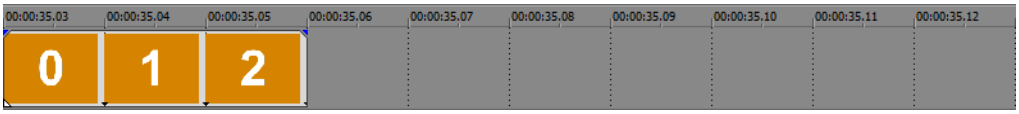
The Lock switch locks an event to prevent it from being moved or edited.

### Loop

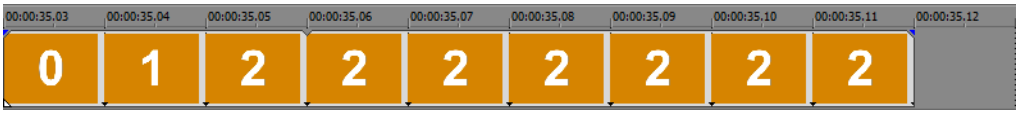
You can loop an event so that you can extend it along the timeline by dragging the right edge of the event. Notches appear in the top of the event to mark where the media in the event ends and then repeats.


Looping notches
Drag the right edge to extend the event
Selected event before loop
Selected event after loop is applied

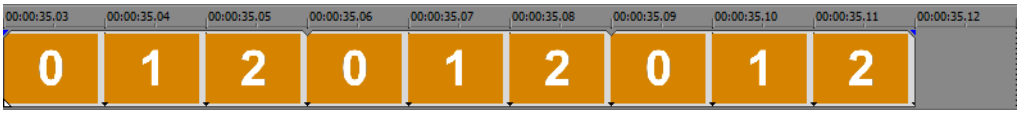
For video events, turning off the Loop switch makes the last frame repeat for the duration of the event beyond its original length, creating a freeze frame effect (as in the middle example below). The Loop switch is enabled for the event in the last example below.




The original three frame clip.




Looping is off. The elongated event repeats (freezes) the final frame.




Looping is on. The entire event repeats.

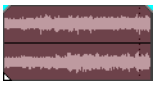
### Invert phase (audio only)

This switch inverts the audio event at its baseline, in effect reversing its polarity. Inverting an event, while creating no audible difference, is occasionally useful for matching transitions when mixing audio on separate tracks or fine-tuning a crossfade.

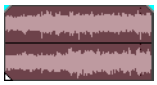
You can also phase invert a track. If a track is inverted and you invert an event on the track, the event is doubly-inverted (restored to its original state). *For more information, see* *Phase inverting a track (audio only) on page 156*.

### Normalize (audio only)

You can normalize an event to maximize its volume, based on the waveform's highest peak, without clipping the event during playback.



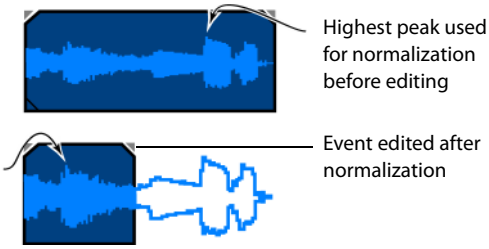
Selected event before normalize



Selected event after normalize is applied

#### Recalculating the normalization

When you normalize an event, the event is analyzed and the volume is raised based on the waveform's highest peak and then adjusts the rest of the event accordingly. If you have adjusted the edge of an event to exclude the (formerly) highest waveform peak, you might want to recalculate the event's normalization.


Highest peak used for normalization before editing
Highest peak used for recalculating the normalization
Event edited after normalization

1. Right-click the event to display a shortcut menu.
2. From the shortcut menu, choose **Properties**. The Properties dialog opens.

3. Click **Re-calculate** to normalize the event again.

**Tip:** *You can set the maximum decibel level used to calculate the event during normalization. For more information, see Audio tab on page 423.*

### Maintain aspect ratio (video only)

Video and image files of various sizes and formats can be included in a single project. The project itself can have a different frame size aspect ratio from the source media files. This is not a problem, but you must specify how these differences are handled. If the length-to-width ratio of the source media and the project's frame size are the same (for example, source media at 320x240 and project frame size of 640x480), no aspect ratio distortion occurs. If the ratios are not the same, the source material might become distorted (stretched or compressed). By maintaining the aspect ratio of the original, the video is kept from becoming distorted by letterboxing or pillarboxing around the edges. This is the default setting.

### Reduce interlace flicker (video only)

This switch can be useful in cases where the source material didn't originate as video and contains extremely high spatial or temporal frequencies. When you watch the rendered (interlaced) output on video of this sort of media, you might see flickering or crawling edges if this switch is not applied.

### Resample (video only)

Resampling allows Vegas Pro software to interpolate frames in an event when the frame rate of a media file is significantly different from the project's frame rate. Resampling can solve some interlacing problems and other jittery output problems. *For more information, see Resampling video on page 275.*

Three options are provided for event-level resampling:

- **Smart resample**: Only resamples the event when the event frame rate does not match the project output frame rate. This can occur either because the event has a velocity envelope or because the frame rate of the original media is different than the project frame rate. **Smart resample** is the standard setting.
- **Force resample**: Always resamples the event, regardless of its frame rate or the project's frame rate.
- **Disable resample**: Does not resample the event.

## Accessing event properties

The properties of an event are automatically determined based on the properties of the source media file. In addition to the event switches (mute, loop, etc.) described in the previous section, event properties include playback and undersample rates for video and pitch shifting for audio.

1. Right-click an event to display a shortcut menu.
2. From the shortcut menu, choose **Properties**. The Properties dialog appears.

The first tab in the dialog, either **Audio Event** or **Video Event**, contains the properties that are exclusively related to your Vegas Pro project. The second tab, the **Media** tab, contains many properties that are an inherent part of the media file itself.

In addition to the event switches discussed in this chapter, event properties on the **Audio Event**/**Video Event** tab include the following:

- For video events, the **Playback rate** box sets the rate of playback. For example, a playback rate of 1 plays at normal speed, while a playback rate of 0.5 plays at half speed. *For more information, see Time compressing/stretching events on page 105.*
- For video events, the **Undersample rate** box allows you to simulate a lower frame rate. For example, an undersample rate of 0.5 plays the event at half its original frame rate. Each frame plays twice as long as in the original media file, creating a strobe effect.
- For audio events, the **Time stretch/pitch shift** section of the dialog allows you to change the pitch, duration, or both pitch and duration of an audio event. *For more information, see Pitch shifting audio events on page 103.*

## Adjusting audio channels

Vegas Pro software allows you to perform audio channel conversion nondestructively. You can mix channels, convert to mono, swap channels in a stereo file, or choose the channel that you want to use in a multichannel file.

1. Select an event and choose **Channels** from the **Edit** menu (or right-click an event and choose **Channels** from the shortcut menu). A submenu is displayed.
2. Choose a command from the submenu to specify how to treat the channels in your file.

| Item | Description |
|---|---|
| **For events that use multichannel audio** | |
| Channel x | Treats the event as a mono file using the audio from the channel you choose. |
| Channels x/y | Treats the event as a stereo file using the audio from the channels you choose. |
| **For events that use stereo audio** | |
| Both | Treats the event as a normal stereo file. |
| Left Only | Creates a mono event using only the left channel of your media file. |
| Right Only | Creates a mono event using only the right channel of your media file. |
| Combine | Creates a mono event by mixing the channels of your media file. After mixing the channels, the amplitude is divided by two to prevent clipping. |
| Swap | Exchanges the right and left channels in a stereo file. |

You can also pan from one channel to the other using either the multipurpose slider or a pan envelope. *For more information, see Using the pan slider (audio only) on page 151.*

## Setting audio streams

When you add a multistream audio file to your project, you can choose which stream you want to use in the event.

1. Select an audio event and choose **Stream** from the **Edit** menu (or right-click an event and choose **Stream** from the shortcut menu). A submenu is displayed.
2. Choose a command from the submenu to choose the stream you want to use.

## Copying and pasting event attributes

You've set up one event exactly the way you want it, and now you want to apply the same attributes to another event. A quick way to copy the attributes of one event and paste them onto another is provided.

You can copy and paste multiple event attributes, including:

- Properties, including audio pitch shift and video playback rate
- Switches
- Video event plug-ins
- Cropping

1. Click the event with the attributes you wish to copy and click the **Copy** button ( ).
2. To paste the event attributes to multiple events, select the events.
3. Right-click an event and choose **Paste Event Attributes** from the shortcut menu. The attributes are pasted onto the selected event(s).

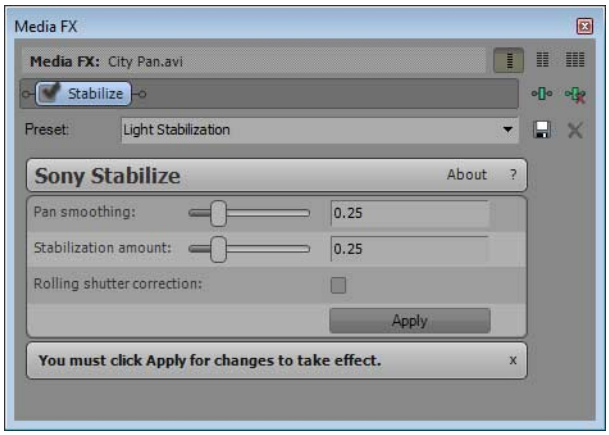
## Stabilizing video clips

You can apply the Stabilize plug-in to analyze and remove camera shake from video.

1. In the Project Media window, select the video you want to stabilize.

> **Tip:** *If you're using only a portion of a longer media file, you can use the Trimmer window to create a subclip that contains only the portion of the media that is used in your project. Stabilizing a subclip requires less processing than stabilizing a full media file.*

2. From the **Tools** menu, choose **Video**, and then choose **Media FX** (or right-click a media file in the Project Media window and choose **Media FX** from the shortcut menu). The Plug-In Chooser is displayed.
3. In the Plug-In Chooser, select the Stabilize plug-in and click the **Add** button. The Media FX window displays the Stabilize plug-in.




4. Choose a setting from the **Preset** drop-down or adjust the controls in the dialog as needed:

| Item | Description |
|---|---|
| **Pan smoothing** | Drag this slider to adjust the amount of shake (left/right and up/down motion) detection.<br>In most cases, the preset's default setting will provide a good balance of accuracy and processing power. Increasing the setting can produce more accurate stabilization if needed. |
| **Stabilization amount** | Drag this slider to adjust the amount of tilt and zoom detection.<br>In most cases, the preset's default setting will provide a good balance of accuracy and processing power. Increasing the setting can produce more accurate stabilization if needed. |
| **Rolling shutter correction** | Select this check box if you want to correct skewing (during horizontal motion) or stretching/compression (during vertical motion) due to rolling shutter. |

5. Click **Apply**. The video is analyzed, and stabilization is applied to your media.

> **Tip:** *To remove stabilization, right-click an media file in the Project Media and choose* **Media FX** *from the shortcut menu to display the Media FX window. You can then bypass the Stabilize plug-in or remove it from the media's effects chain.*

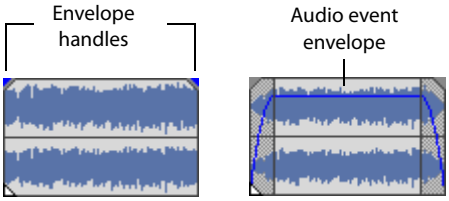
## Using audio event envelopes (ASR)

You can apply envelopes to individual events. Envelopes, also known as ASRs (attack, sustain, and release), give you the ability to control an audio event's fade-in, fade-out, and overall volume level.

**Notes:**

- *Event envelopes only affect an event. Track envelopes affect the entire track. For more information, see* *Composite level automation (video only) on page 169*.
- *If you want to display fade lengths in selected events, select the* **Event Fade Lengths** *option on the* **View** *menu.*

When you add an event to your project, handles are added that are used to set the envelope. As you use these handles on audio events, a volume envelope appears indicating how the event is being affected.

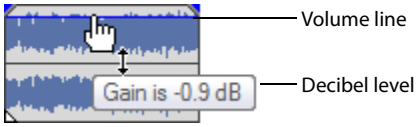



### Setting an audio event's volume

When you place the mouse pointer at the top of the event, the pointer changes to a hand cursor (☝) that you can use to lower the event's overall volume.

1. Place the mouse pointer at the top of the event.
2. When you see the envelope cursor (☝), drag the volume envelope to the desired level. As you drag, the event's decibel level is displayed.

   You can make fine adjustments by holding Ctrl or clicking the right mouse button while dragging the envelope.

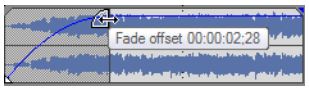



**Note:** *When you have multiple events selected, the gain of all selected events is adjusted simultaneously.*

### Setting an event's fade in and out

The event handles allow you to change an audio event's fade in and out volume. You can also change the type of curve that the event uses to control the volume's fade in or out.

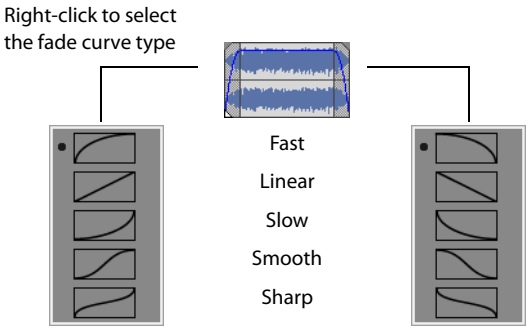
1. Place the mouse pointer on a handle (upper corners of the event). The pointer changes to the envelope cursor ( ).
2. Click the corner of the event and drag to create a fade.




To remove a fade, drag the end of the fade curve back to the edge of the event.

### Changing an event's fade curve

You can set the shape of the fade curve (fast, linear, slow, smooth, or sharp) that an event uses to raise or lower the volume over time. To access the different fade curves, right-click anywhere in the event's fade-in or fade-out region and choose **Fade Type** from the shortcut menu.




**Tip:** *If you use the same fade curve frequently, you can set it as a default for all new audio event envelopes. For more information, see* *Editing tab on page 427*.

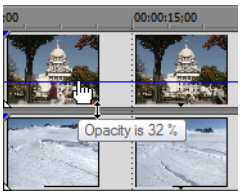
## Using video event envelopes

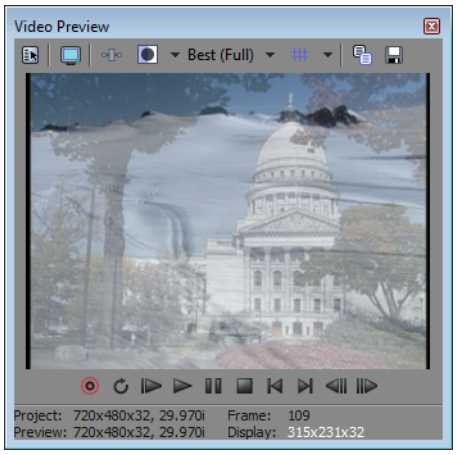
Video envelopes allow you to control an event's opacity or velocity over time. Envelopes appear as lines on an event. With a velocity envelope, you have the added control of being able to create and edit envelope points.

**Note:** *Event envelopes only affect an event. Track envelopes affect the entire track. For more information, see* *Composite level automation (video only) on page 169*.

### Using opacity envelopes

Opacity envelopes set the overall opacity and allow you to fade video events in and out. This affects the transparency of the event in relation to background events on lower tracks. These background events can be other video events or background colors.




#### Setting a video event's opacity

When you place the mouse pointer at the top of the event, the pointer changes to a hand cursor (☝) that you can use to lower the event's overall opacity.

1. Place the mouse pointer at the top of the event.
2. When you see the envelope cursor (☝), drag the opacity envelope to the desired level. As you drag, the event's opacity level is displayed.

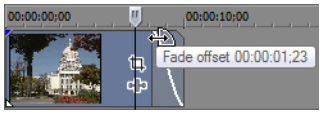
   You can make fine adjustments by holding Ctrl or clicking the right mouse button while dragging the envelope.

**Note:** *When you have multiple events selected, the opacity of all selected events is adjusted simultaneously.*

#### Setting an event's fade in and out

The event handles allow you to change a video event's fade in and out. You can also change the type of curve that the event uses to control the fade in or out.

1. Place the mouse pointer on a handle (upper corners of the event). The pointer changes to the fade offset cursor (↔).
2. Click the corner of the event and drag to create a fade.




   You can make fine adjustments by holding Ctrl or clicking the right mouse button while dragging the fade curve.

### Changing an event's fade curve

You can set the shape of the fade curve (fast, linear, slow, sharp, or smooth) that an event uses to increase or decrease the opacity over time. To access the different fade curves, right-click anywhere in the event's fade-in or -out region and choose **Fade Type** from the shortcut menu.

> **Tip:** *If you use the same fade curve frequently, you can set it as a default for all new video event envelopes. For more information, see* *Editing tab on page 427*.

## Using velocity envelopes

You can use velocity envelopes to change the speed of a video event over time. To view a velocity envelope, right-click the event, choose **Insert/Remove Envelope**, and then choose **Velocity** from the submenu.

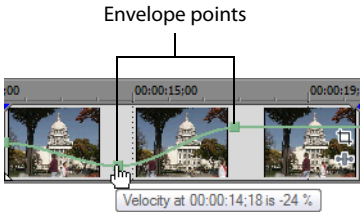
1. Right-click an event, choose **Insert/Remove Envelope**, and then choose **Velocity** from the submenu. The velocity envelope appears on the event as a blue line.
2. To increase the speed, drag the envelope up. To slow the video down, drag the envelope down.

   You can make fine adjustments by holding Ctrl or clicking the right mouse button while dragging the envelope.

### Adding velocity envelope points

When combined with points, envelopes can be used to animate velocity changes.

1. Double-click the envelope where you want to add a point.
2. Drag the point to adjust it. The time and velocity level of the point are displayed as you drag.
3. Right-click the envelope between two points to choose a fade type (linear, fast, slow, smooth, or sharp) to set the shape of the curve.




> **Tip:** *To delete a point, right-click the point and choose* **Delete**.

Making a video play at twice its normal speed makes the duration of the video half as long. Likewise, slowing a video down makes it longer (with 0% being an infinite freeze frame). For example, if you decrease the speed of a ten-second video event by 50%, only five seconds of video play (played over the course of the ten-second event), meaning that only half as much actual footage from the original event plays. On the other hand, if the speed is increased 200%, the ten seconds of content play in only five seconds. The remaining five seconds of the event are filled either with a freeze of the last frame or with ten additional seconds of video content from the longer file.

You might want to resample the frame rate of an event that has been significantly slowed. To resample an event, right-click the event and choose **Properties**. Then, on the **Video Event** tab, select the **Resample** check box. *For more information, see* *Resampling video on page 275*.

### Using the Envelope Edit Tool

While you can edit envelopes using the Normal Edit tool ( ), you can limit your editing to envelopes only by clicking the **Envelope Edit Tool** button ( ). You cannot move, trim, or otherwise modify events with this tool, which allows you to edit envelope points without making any other unwanted changes. *For more information, see* *Using the Envelope Edit tool on page 174*.

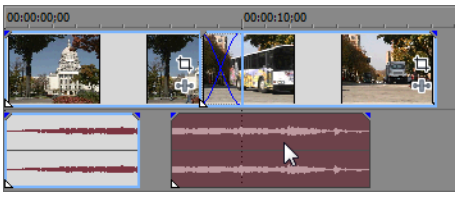
### Removing a velocity envelope

To remove a velocity envelope and all of its settings, right-click the event, choose **Insert/Remove Velocity Envelope**, and then choose **Velocity** from the submenu.

## Grouping events

You are allowed to group events together within tracks or across separate tracks.

Once you create a group, you can move all the events in the group within their tracks as a unit and apply event-specific edits at the same time. You can still edit properties of individual events within a group without affecting the other events in a group.




Dragging one event in a group moves all events in the group.

**Note:** *When the* **Cut, copy, and delete grouped events** *check box on the* **Editing** *tab of the Preferences dialog is selected, cutting, copying, or deleting an event will affect all events in the same group.*

### Creating a new group

Grouping is useful when you want to preserve timing of events and move events together along the timeline.

1. Select the events you want to group.
2. From the **Edit** menu, choose **Group**, and choose **Create New** from the submenu.

### Adding an event to an existing group

1. Right-click an event in the existing group, choose **Group** from the shortcut menu, and choose **Select All** from the submenu to select all of the members of the group.
2. Press Ctrl and click the event to be added to the group.
3. Right-click the event, choose **Group** from the shortcut menu, and choose **Create New** from the submenu.

**Note:** *Events can only be in one group at a time. Adding an event to an existing group essentially clears the old group and creates a new one that includes all of the selected events.*

### Removing events from a group

You can remove individual events from a group without affecting the other members of the group. An event you remove from the group is not deleted from the project and remains on the timeline.

**Note:** *When the* **Cut, copy, and delete grouped events** *check box on the* **Editing** *tab of the Preferences dialog is selected, cutting, copying, or deleting an event will affect all events in the same group.*

1. Right-click the event you want to remove from the group.
2. From the shortcut menu, choose **Group**, and choose **Remove From** from the submenu. The event is removed from the group. The rest of the grouped events remain intact.

### Clearing a group

You can ungroup all events by clearing the entire group. Clearing a group does not remove events from your project.

1. Right-click one of the members of the group.
2. From the shortcut menu, choose **Group**, and choose **Clear** from the submenu.

### Selecting all members of a group

While grouped events move together within their tracks, selecting one member of a group does not automatically select every member of that group.

1. Right-click one of the members of the group.
2. From the shortcut menu, choose **Group**, and choose **Select All** from the submenu.

   With all events in a group selected, you can move the group to other tracks, or cut and paste the group to a new location.

### Suspending grouping temporarily

You can temporarily suspend the grouping behavior of all groups (including video media files with included audio streams) by clicking the **Ignore Event Grouping** ( ) button.

### Cutting, copying, or deleting grouped events

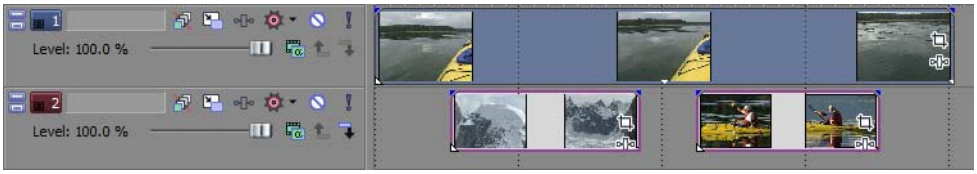
**Note:** *When the* **Cut, copy, and delete grouped events** *check box on the* **Editing** *tab of the Preferences dialog is selected, cutting, copying, or deleting an event will affect all events in the same group.*

1. Select the events you want to cut or delete.
2. From the **Edit** menu, choose **Group**, and choose **Cut All**, **Copy All**, or **Delete All** from the submenu. The selected events and any events that are grouped with the selected events are deleted or copied/cut to the clipboard.

## Using sync links

Sync links are like one-way event groups. An event stays synchronized with the event to which it is linked, but not the other way around. Linked events do not contribute to the affected tracks for ripple editing. Sync links are useful for keeping additional audio mix and video composite elements synchronized with the main events in your project.

Linked events are displayed shorter and vertically aligned with the synchronized event. When you select an event that has linked events, the linked events are outlined in purple.




In this example, the events on track 2 are linked with the event on track 1.

When you move the event on track 1, the events on track 2 will stay synchronized.

You can move the linked events on track 2 without affecting the location of the event on track 1.

### Creating a sync link

1. Select the events you want to link.
2. Right-click the event that should be the synchronized event and choose **Create Sync Link with Selected Events** from the shortcut menu.

### Removing a sync link

1. Select the events in the sync link.

> **Tip:** *To quickly select all events in a sync link, right-click one event in the sync link, choose* **Sync Link** *from the shortcut menu, and then choose* **Select All** *from the submenu.*

2. Right-click the synchronized event and choose **Remove Sync Link from Selected Events** from the shortcut menu.

### Unlinking an event in a sync link

1. Select the event you want to unlink from a sync link.
2. Right-click the event, choose **Sync Link** from the shortcut menu, and then choose **Unlink** from the submenu.

### Selecting all events in a sync link

1. Select one event in the sync link.
2. Right-click the event, choose **Sync Link** from the shortcut menu, and then choose **Select All** from the submenu.

Chapter 11

# Mixing Audio

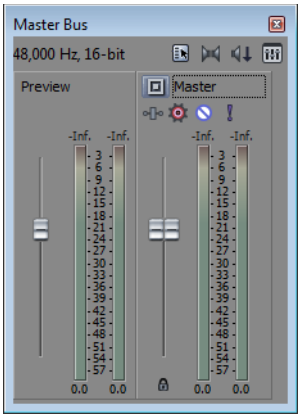
You can mix your audio tracks in two ways:

- The audio track controls in the track list allow you to adjust relative track volumes, panning, assignable FX send levels, and bus send levels for individual tracks.
- The Mixing Console window allows for advanced multichannel mixing using multiple busses and assignable effects using a traditional hardware-style mixer view.

## Master Bus window

The Master Bus window provides you with a streamlined view of your project's master output.

From the **View** menu, choose **Master Bus** to toggle the display of the window.



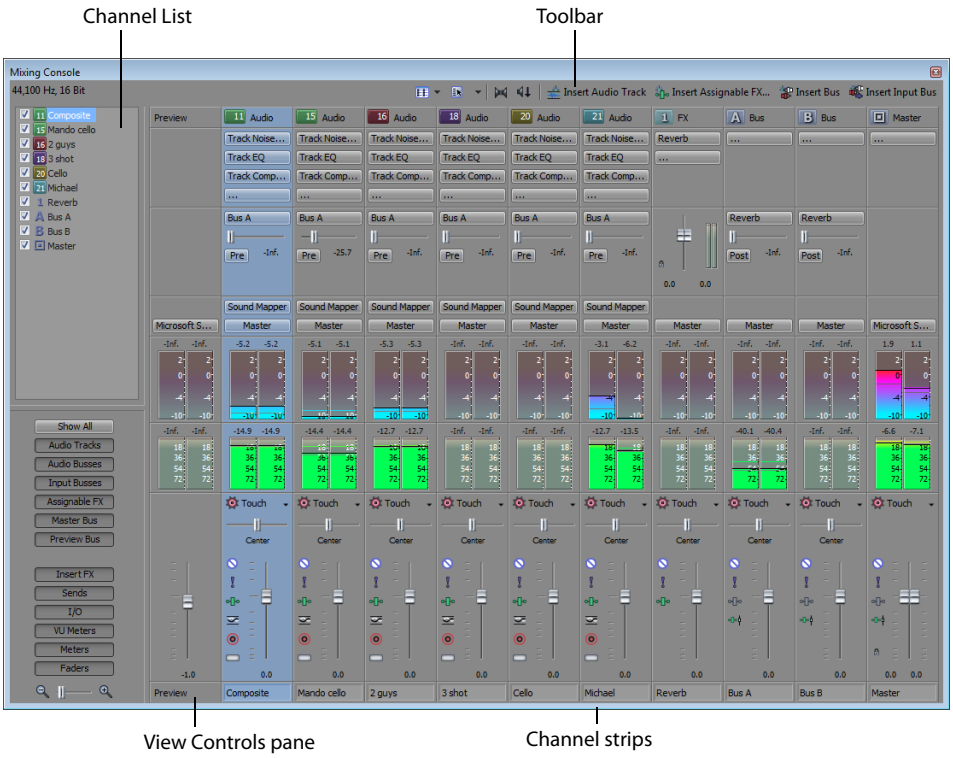

| Button | Item | Description |
|---|---|---|
| | **Audio Properties** | Opens the **Audio** tab in the Project Properties dialog. |
| | **Downmix Output** | Downmixes your audio from 5.1 surround to stereo or from stereo to mono so you can ensure your mix will sound the way you intended it —even when your audience's hardware has fewer channels than the original mix.<br>The button represents the current playback mode:<br>5.1 surround output<br>Stereo output<br>Mono output |
| | **Dim Output** | Attenuates the volume of all busses that are routed to hardware outputs by 20 dB so you can check your mix at a lower level (or answer the phone or hear the pizza-delivery truck). Click again to restore volume and tune out your cantankerous assistant. |
| | **Open Mixing Console** | Click to open the Mixing Console, which provides an integrated view of all tracks and busses in your project using the appearance of a traditional hardware-based mixer.<br>You can use the Mixing Console to add and control audio tracks, assignable effects chains, busses, and input busses. |
| | **Preview Control** | Controls the loudness of media played through the Project Media, Trimmer, Explorer, or Media Manager window.<br>**Tip:** *Right-click in the Master Bus window and choose* **Show Preview Fader** *to toggle the display of the preview control.* |
| | **Master Bus Control** | Use the bus control to adjust levels and panning, add effects, and mute or solo the bus. |

| Button | Item | Description |
|---|---|---|
| | **Master FX** | Displays the Plug-In Chooser if there are no plug-ins assigned, or displays the Master FX window if the bus has an effects chain.<br><br>**Tip:** *Right-click the button and choose* **Post Volume** *from the shortcut menu if you want to apply the effects chain after the bus volume. This has the same effect as right-clicking the bus output fader and choosing* **Pre FX** *from the shortcut menu.* |
| | **Automation Settings** | The controls in the bus control list can function as trim controls or automation controls for bus volume, panning, and muting.<br><br>Click the button and verify **Show Automation Controls** is not selected if you want the bus control to function as a trim control. Adjusting a trim control affects the entire track.<br><br>Click the button and choose **Show Automation Controls** to adjust automation settings. *For more information about automation, see Using Automation on page 163.* |
| | **Mute** | Excludes the bus from playback.<br><br>When **Show Automation Controls** is selected, the button is displayed with an automation icon, and you can use the button to edit mute automation on the bus's bus track. |
| | **Solo** | Plays only the bus during playback. |
| | **Output Fader** | Drag to adjust the volume of the bus. Double-click the center of the thumb to reset the fader to 0.0 dB.<br><br>If the right and left channels of the Master bus are set differently, you can double-click either thumb to force the other channel to match it.<br><br>When **Show Automation Controls** is selected, the thumb is displayed with an automation icon, and you can use the fader to edit volume automation on the bus's bus track.<br><br>**Tip:** *Right-click the thumb and choose* **Pre FX** *or* **Post FX** *from the shortcut menu to specify whether the bus level is applied before or after the bus effects chain.* |
| | **Meter** | Displays the playback level at the output of the bus. This is the level that will be sent to the selected audio device.<br><br>Right-click the meter and choose a setting from the shortcut menu to change the resolution. |
| | **Lock/Unlock Fader Channels** | Click to lock (gang) the faders so the left and right channels will always move together. Click again to unlock the faders.<br><br>**Note:** *Hold Shift while dragging a fader to temporarily override the current state of the button: if the button is turned off, you can hold Shift to drag the faders in locked mode; if the button is selected, hold Shift to drag the faders independently.* |

## Mixing Console window

From the **View** menu, choose **Mixing Console** to toggle the display of the Mixing Console window.

The Mixing Console window provides an integrated view of all tracks and busses in your project using the appearance of a traditional hardware-based mixer.



## Mixing Console toolbar

The Mixing Console toolbar is displayed at the top of the Mixing Console window and allows you to quickly configure the window's display; downmix audio; dim the output; or add tracks, assignable effects, or busses.

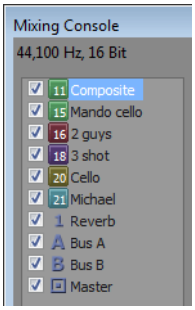
| Item | | Description | |
|---|---|---|---|
| | **Views** | Click the down arrow and choose a command from the menu: | |
| | | **Channel List** | Displays or hides the Channel List on the left side of the Mixing Console window.<br>Select a channel strip's check box to display it in the Mixing Console, or clear a check box to hide a channel strip without removing from your project. |
| | | **View Controls** | Displays or hides the View Controls pane, where you can show or hide components in the Mixing Console window. |
| | **Properties and Layout** | Click the **Properties and Layout** button ( ) to open the **Audio** tab in the Project Properties dialog, or click the down arrow and choose a command from the menu: | |
| | | **Audio Properties** | Displays the **Audio** tab in the Project Properties dialog. |
| | | **Channel Width** | Choose a setting to indicate whether you want to view narrow, medium (default), or wide channel strips in the Mixing Console window. |
| | | **Show Channels** | Choose a command to configure which channel strips are displayed in the Mixing Console window.<br>• **All:** Displays all channel strips in the Mixing Console.<br>• **Audio Tracks**: Shows or hides audio track channel strips. *For more information, see Using audio track channel strips on page 199*.<br>• **Audio Busses:** Shows or hides auxiliary bus channel strips. *For more information, see Using bus channel strips on page 207*.<br>• **Input Busses:** Shows or hides input bus channel strips. *For more information, see Using input bus channel strips on page 213*.<br>• **Assignable FX Busses:** Shows or hides assignable FX channel strips. *For more information, see Using FX send (assignable effects) channel strips on page 219*.<br>• **Master Bus**: Shows or hides the Master bus channel strip.<br>• **Preview Bus**: Shows or hides the Preview bus channel strip. |
| | | **Show Control Regions** | Choose a command to configure which portions of the channel strips are displayed in the Mixing Console window.<br>• **All**: Displays all control regions.<br>• **Insert FX**: Shows or hides the Insert FX control region.<br>• **Sends**: Shows or hides the Sends control region.<br>• **I/O**: Shows or hides the I/O control region.<br>• **VU Meters:** Shows or hides the VU/PPM control region.<br>• **Peak Meters**: Shows or hides Peak Meters.<br>• **Faders**: Shows or hides volume faders. |
| | | **Show Region Labels** | Choose this command to show or hide control region labels in channel strips. |
| | | **Show Fader Ticks** | Choose this command to show or hide scale indicators next to fader controls. |
| | | **Channel Width** | Choose a setting to indicate whether you want to view narrow, medium (default), or wide channel strips in the Mixing Console window. |
| | | **Meter Layout** | Choose **Meter Layout**, and then choose a command from the submenu to reset clip indicators; set the display range; or display labels, peaks, or valleys in the channel meters. |
| | **Downmix Output** | Downmixes your audio from 5.1 surround to stereo or from stereo to mono so you can ensure your mix will sound the way you intended it—even when your audience's hardware has fewer channels than the original mix.<br>The button represents the current playback mode: | |
| | | | 5.1 surround output |
| | | | Stereo output |
| | | | Mono output |

| Item | | Description |
|---|---|---|
| | **Dim Output** | Attenuates the volume of all busses that are routed to hardware outputs by 20 dB so you can check your mix at a lower level (or answer the phone). Click again to restore volume. |
| | **Insert Audio Track** | Adds an audio track to your project. *For more information, see Using audio track channel strips on page 199.* |
| | **Insert Assignable FX** | Creates an assignable FX chain that you can route to one or more tracks in your project.<br>To delete an assignable FX chain, right-click the assignable FX channel strip and choose **Delete** from the shortcut menu.<br>*For more information, see Using FX send (assignable effects) channel strips on page 219.* |
| | **Insert Bus** | Adds a bus to your project. The **Audio** tab in the Project Properties dialog is updated to reflect the new number of busses.<br>To delete a bus, right-click the channel strip for the bus and choose **Delete** from the shortcut menu.<br>*For more information, see Using bus channel strips on page 207.* |
| | **Insert Input Bus** | Adds an input bus to your project.<br>To delete a bus, right-click the channel strip for the bus and choose **Delete** from the shortcut menu.<br>*For more information, see Using input bus channel strips on page 213.* |

### The Channel List pane

The Channel List pane is displayed on the left side of the Mixing Console window.

To show or hide the pane, click the down arrow next to the **Views** button ( ) and choose **Channel List** (or press Ctrl+C).

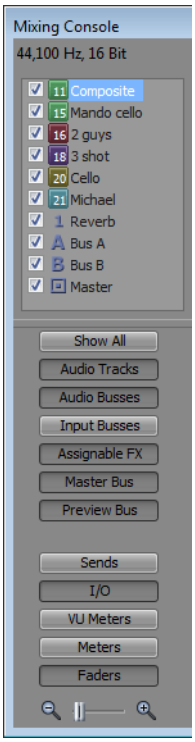



The top of the Channel List pane displays a listing of all tracks, busses, and assignable effects chains in your project. Select a channel's check box to include it in the Mixing Console display, or clear a check box to hide the channel without removing it from your project.

Clicking a track, bus, or assignable effects chain in the Channel List pane selects that channel. You can hold Ctrl or Shift to select multiple channels to perform ganged edits.

### The View Controls pane

The View Controls pane is displayed on the left side of the Mixing Console window. If the Channel List pane is visible, the View Controls pane is displayed below the Channel List pane.




You can use the buttons in this pane to show or hide components in the Mixing Console.

| Item | Description |
|---|---|
| **Show All** | Click to show channel strips for all tracks, busses, and assignable effects chains. |
| **Audio Tracks** | Click to show or hide channel strips for audio tracks.<br>If you project does not contain any audio tracks, this button is unavailable. |
| **Audio Busses** | Click to show or hide channel strips for audio busses.<br>If you project does not contain any audio busses, this button is unavailable. |
| **Input Busses** | Click to show or hide channel strips for input busses.<br>If you project does not contain any input busses, this button is unavailable. |
| **Assignable FX** | Click to show or hide channel strips for assignable effects chains.<br>If you project does not contain any assignable effects chains, this button is unavailable. |
| **Master Bus** | Click to show or hide the channel strip for the Master bus. |
| **Preview Bus** | Click to show or hide the channel strip for the Preview bus. |
| **Insert FX** | Click to show or hide the insert effects control region in channel strips. |
| **Sends** | Click to show or hide the sends control region in channel strips. |
| **I/O** | Click to show or hide the I/O control region in channel strips. |
| **VU Meters** | Click to show or hide the VU/PPM control region in channel strips. |
| **Meters** | Click to show or hide the peak meters control region in channel strips. |
| **Faders** | Click to show or hide the Faders control region in channel strips. |
| **Channel Width** | Drag the slider toward the **Zoom Out Track and Bus Width** button ( ) to decrease the width of channel strips, or drag toward the **Zoom In Track and Bus Width** button ( ) to increase channel strip widths. |

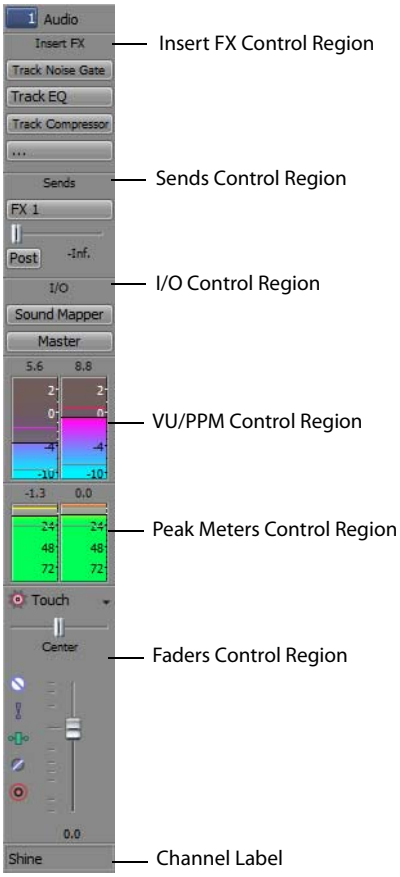
### Channel strips

Audio tracks, audio busses, input busses, and assignable effects chains are displayed as channel strips in the Mixing Console.

When a control surface is enabled, an indicator is displayed in the Mixing Console to indicate which channels are under external control. Multiple bars are displayed if a channel is under the control of multiple devices.

**Tips:**

- *If you want to change the order in which channel strips are displayed, you can click the channel label and drag a channel strip to a new location.*
- *Hover over a fader and roll your mouse wheel to change its setting.*
- *To edit a fader value quickly, you can double-click the displayed value to type a new value.*
- *Hold Ctrl while dragging a fader to move it in fine increments.*




| Item | Description |
|---|---|
| **Insert FX Control Region** | The Insert FX control region displays the insert effects chain for a track or bus. |
| **Sends Control Region** | The Sends control region displays controls for routing tracks to busses or assignable effects chains. For assignable effects chains, the Sends control region also displays an input fader and meter. |
| **I/O Control Region** | The I/O control region allows you to choose the recording input for a track or route a channel to a bus or hardware output. |
| **VU/PPM Control Region** | The VU/PPM control region displays volume unit (VU) and peak program (PPM) meters to help you determine the perceived loudness of your signal. Peak program meters provide faster response times to volume increases than VU meters.<br><br>**Tip:** *To change the range of all VU meters in the Mixing Console, right-click a meter and choose a range from the shortcut menu.* |

| Item | Description |
|---|---|
| **Peak Meters Control Region** | The Peak Meters control region displays peak meters you can use to monitor instantaneous levels during playback and determine the loudest level in your audio signal.<br><br>**Tip:** *To change the range of all meters in the Mixing Console, drag the* **Meter Range** *slider in the View Controls pane (or right-click a meter and choose a range from the shortcut menu).* |
| **Faders Control Region** | The Faders control region allows you to control a channel's gain.<br>• Audio track channels display controls for the track automation mode, arm for record, input monitor mode, mute, solo, pan, track gain, and phase.<br>• Bus channels display controls for the bus automation mode, mute, solo, pan, bus gain, and pre/post fader effects processing.<br>• Assignable effects channels display controls for the bus automation mode, mute, solo, pan, bus gain, and pre/post fader effects processing.<br><br>If the Peak Meters control region is not visible, the Faders control region also displays a peak meter. |
| **Channel Label** | The Channel Label displays the name of the track or bus. Double-click to edit the name. |

## Adding track, assignable FX, and bus channels

In its default configuration, the Mixing Console displays a channel for each track, bus, and assignable effects chain in your project.

You can use the buttons on the Mixing Console toolbar to add tracks, assignable effects chains, or busses to your project:

| Item | | Description |
|---|---|---|
| | **Insert Audio Track** | Adds an audio track to your project. *For more information, see Using audio track channel strips on page 199.* |
| | **Insert Assignable FX** | Creates an assignable FX chain that you can route to one or more tracks in your project.<br>To delete an assignable FX chain, right-click the assignable FX channel strip and choose **Delete** from the shortcut menu.<br>*For more information, see Using FX send (assignable effects) channel strips on page 219.* |
| | **Insert Bus** | Adds a bus to your project. The **Audio** tab in the Project Properties dialog is updated to reflect the new number of busses.<br>To delete a bus, right-click the channel strip for the bus and choose **Delete** from the shortcut menu.<br>*For more information, see Using bus channel strips on page 207.* |
| | **Insert Input Bus** | Adds an input bus to your project.<br>To delete an input bus, right-click the channel strip for the bus and choose **Delete** from the shortcut menu.<br>*For more information, see Using input bus channel strips on page 213.* |

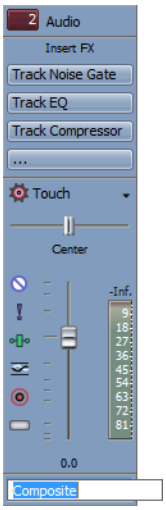
## Using audio track channel strips

A separate channel strip is displayed for each audio track in your project. Each channel strip mirrors controls that are displayed in the track header.

To show or hide audio track channel strips, click the **Audio Tracks** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

### Renaming audio tracks

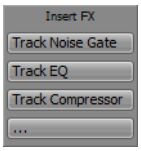
To rename a track, double-click the track label at the bottom of the channel strip and type a new name in the box (or press F2 to rename the selected track). The channel strip in the Mixing Console and the track header are updated when you press Enter.



## Adding or editing track (insert) effects

When the Insert FX control region is visible, each track displays its effects chain at the top of the channel strip.

To show or hide the Insert FX control region, click the **Insert FX** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*




Each effect is displayed as a button. You can hover over the button to see a ToolTip that displays the full plug-in and preset name.

**Tip:** *When the Insert FX control region isn't visible, you can click the* **Edit Insert FX chain** *button (*) *in the Faders control region to display the Audio Track FX window for the track's effects chain.*

### Adding a plug-in

Click the **Add New Insert FX** button (...) and then choose a new plug-in from the menu to add a new plug-in to the effects chain.

### Editing effects settings

Click an effect's button to display the Audio Track FX window, where you can adjust the plug-in's settings.

When you right-click an effect's button, a shortcut a menu is displayed:

- Choose **Show <Plug-In Name>** to open the Audio Track FX window, where you can adjust the plug-in's controls.
- Choose **Bypass <Plug-In Name>** to temporarily bypass a plug-in.

  When an effect is bypassed, its button is displayed in red text.

- Choose **Remove <Plug-In Name>** to remove a plug-in from the track effects chain.
- Choose **Presets**, and then choose a setting from the submenu to load a new preset.
- To replace the current plug-in, right-click the effect's button, and then choose a new plug-in from the menu. Plug-ins are organized in submenus by type (EQ, Dynamics, Reverbs, etc.).

## Adjusting bus or assignable effects send levels

When the Sends control region is visible, each track displays controls you can use to route the track to busses and assignable effects chains.

To show or hide the Sends control region, click the **Sends** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

When the **Automation Settings** button ( ) in the Faders control region is not selected, click the **Active Send** button and choose a bus or assignable effects chain from the menu, and then drag the fader to adjust the send level.

When the **Automation Settings** button ( ) in the Faders control region is selected, the fader handle is displayed as with an automation icon ( ), and you can use it to edit send volume automation on the track.

**Note:** *The trim level is added to the automation settings so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.*

**Tip:** *To adjust the size of the Sends control region, you can drag the bottom divider to make more or fewer sends visible.*

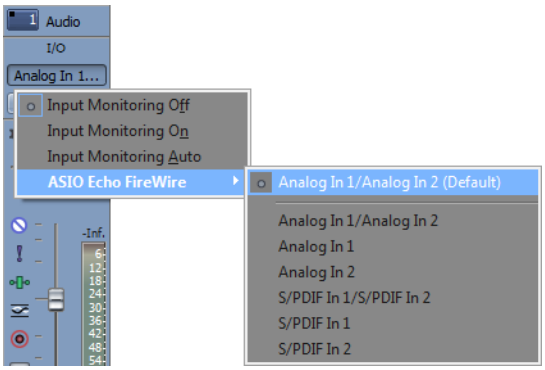
Bus sends are pre-volume (and pre-mute) by default. When bus sends are pre-volume, you can create a cue mix that is independent of your main mix. *For more information, see Creating a Cue (Headphone) Mix with the Mixing Console on page 225*. To change to post-volume (and post-mute), click the **Pre/Post** button to switch to **Post Volume Send** mode.

### Changing a track's input or output device

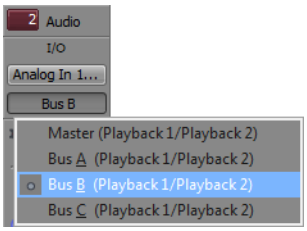
When the I/O control region is visible, each track displays controls you can use to set the track's input device (for recording) and output device.

To show or hide the I/O control region, click the **I/O** button in the View Controls pane. *For more information, see The View Controls pane on page 196*.

To choose the recording input for the track, click the **Input** button and choose a port from the menu.



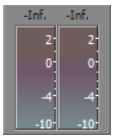

To route a track to a bus, click the **Output** button and choose a bus from the menu.



### Monitoring track levels with VU/PPM meters

When the VU/PPM Meters control region is visible, you can display volume unit (VU) and peak program (PPM) meters to help you determine the perceived loudness of your audio signal (peak program meters provide faster response times to volume increases than VU meters).

To show or hide the VU/PPM Meters control region, click the **VU Meters** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*




Right-click the meter and choose a setting from the shortcut menu (or hover over the meter and roll your mouse wheel) to change the resolution and display options.

| Item | Description |
|---|---|
| **Show VU/PPM** | Use this command to show or hide meters for individual channels. |
| **Reset Clip** | Clears clipping indicators. |
| **Traditional VU** | The traditional VU meter is displayed with a scale of -10 dB to +2 dB. 0 dB on the VU meter equals 4 dBu. |
| **Extended VU** | The extended VU meter is displayed with a scale of -30 dB to +8 dB. 0 dB on the VU meter equals 4 dBu. |
| **Logarithmic VU** | Displays the meters in a logarithmic scale (like the Sound Forge peak meters) instead of the linear scales traditionally associated with VU meters. |
| **UK PPM** | The UK peak program meter (also known as a BBC meter) is a Type II meter and is displayed with a scale of 1 to 7, which corresponds to a range of -12 to 12 dBu: |

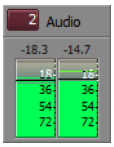
| **UK Marks** | **dBu** |
|---|---|
| 7 | 12 |
| 6 | 8 |
| 5 | 4 |
| 4 | 0 |
| 3 | 4 |
| 2 | 8 |
| 1 | -12 |

| | |
|---|---|
| **EBU PPM** | The EBU peak program meter is a Type II meter and is displayed with a scale of -12 to +12, which corresponds to -12 dBu to 12 dBu. 0 on the EBU PPM equals 0 dBu.<br>The EBU PPM and UK PPM respond identically to increases in volume, but the EBU PPM decays more slowly. |
| **DIN PPM** | The DIN peak program meter is a Type I meter and is displayed with a scale of -50 dB to +5 dB, which corresponds to -44 dBu to 11 dBu. 0 dB on the DIN PPM equals 6 dBu. |
| **Nordic PPM** | The Nordic peak program meter is a Type I meter and is displayed with a scale of -42 dB to +12 dB, which corresponds to -42 dBu to 12 dBu. 0 dB on the Nordic PPM equals 0 dBu. |
| **Show Labels** | Toggles the meter level labels on and off. |
| **Show Peaks** | Toggles peak level indicators on the top of the meter. |
| **Hold Peaks** | When selected, the highest peak levels are represented by a thin line on the meter. |
| **Hold Valleys** | When selected, the lowest peak levels are represented by a thin line on the meter. |
| **Vintage Mode** | When Vintage Mode is selected, the VU meters use a different calculation method to simulate the response of analog VU meters. |

### Monitoring track levels with peak meters

When the Meters control region is visible, each track displays meters you can use to monitor track levels.

To show or hide the Meters control region, click the **Meters** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*




**Note:** *If the Meters control region is not visible, peak meters are displayed in the Faders control region.*

Right-click the meter and choose a setting from the shortcut menu (or hover over the meter and roll your mouse wheel) to change the resolution and display options.

**Tip:** *Right-click the peak meters and choose* **Show Peak Meter** *to show or hide meters for individual channels.*

### Changing a track's automation mode

When the Faders control region is visible, each track displays controls you can use to adjust track panning, volume and muting. The controls can adjust static (trim) or automation levels. Use the **Automation Settings** button ( ) at the top of the Faders control region to choose the automation mode and turn automation on or off.

To show or hide the Faders control region, click the **Faders** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

To change a track's automation recording mode, click the down arrow next to the **Automation Settings** button ( ) and choose a setting from the menu.

The track controls behave differently depending on the track's automation recording mode:

- When the track automation mode is set to **Off** ( ), the control adjusts the level of the entire track. In this mode, the automation control acts as a second trim control.
- When the track has a volume or pan envelope and the track automation mode is set to **Read** ( ), the control will follow the envelope during playback but cannot be adjusted.
- When the track automation mode is set to **Touch** ( ) or **Latch** ( ), the control edits the envelope setting at the cursor position. If the track does not have an envelope, an envelope will be added when you adjust the control.

Click the button (so the **Automation Settings** button is not selected) if you want the Fader control region controls to function as trim controls. Adjusting a trim control affects the entire track. When the **Automation Settings** button is selected, you can use the buttons to edit pan, volume, and mute automation for the track.

## Muting or soloing a track

When the Faders control region is visible, each track displays **Mute** ( ) and **Solo** ( ) buttons.

To show or hide the Faders control region, click the **Faders** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

### Muting a track

When the **Automation Settings** button ( ) is not selected, you can click the **Mute** button ( ) to prevent a track from being played in the mix. Click the **Mute** button on additional tracks to add them to the mute group. To unmute a track, click the **Mute** button again.

When the **Automation Settings** button ( ) is selected, the **Mute** button is displayed with an automation icon ( ), and you can use the button to edit mute automation.

### Soloing a track

Click the **Solo** button ( ) to mute all unselected tracks. Click the **Solo** button on additional tracks to add them to the solo group. To remove a track from the solo group, click its **Solo** button again.

## Inverting a track's phase

When the Faders control region is visible, each track displays an **Invert Track Phase** button ( ).

To show or hide the Faders control region, click the **Faders** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

Click the **Invert Track Phase** button ( ) to reverse the phase of all events on an audio track.

Although inverting data does not make an audible difference in a single file, it can prevent phase cancellation when mixing or crossfading audio signals.

Select multiple tracks to invert several tracks simultaneously.

**Note:** *If the* **Invert** *event switch is selected, inverting the phase of the track will return the event to its original phase.*

### Arming a track for recording or toggle input monitoring

When the Faders control region is visible, each track displays an **Arm for Record** button ( ) and an **Input Monitor Mode** button ( ) you can use to turn record input monitoring on or off.

To show or hide the Faders control region, click the **Faders** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

#### Arming tracks for recording

Select the **Arm for Record** buttons ( ) on the tracks where you want to record. Arming a track enables it for recording.

When a track is armed, the track meter displays the track's level. If input monitoring is not on, the meter displays the level of your input source. If input monitoring is turned on, the meter shows the level of the input source plus the track effects chain.

#### Toggling record input monitoring

Click the **Input Monitor Mode** button ( ) and choose a command from the menu.

**Note:** *This button is available only when you're using a low-latency audio device that supports input monitoring.*

To turn on input monitoring, click the **Input Monitor Mode** button ( ) and choose and then choose **Input Monitor Mode: On** ( ) or **Input Monitor Mode: Auto** ( ) from the menu. During recording, your signal will be played back with the current track effects chain, but a dry (unprocessed) signal is recorded.

When **On** ( ) is selected, the behavior is similar to **Auto** mode, but you will always hear the input monitor during recording—monitoring is not toggled on and off when recording in to a selected event.

When **Auto** ( ) is selected, you will hear the input monitor signal when playback is stopped and during recording. If you're recording into selected events, you'll hear the input monitor signal only when the cursor passes over the selected events.

**Important:** *Your ability to monitor effects in real time is dependent on your computer's performance. Effect automation envelopes are bypassed during record monitoring.*

### Adjusting track panning or volume

When the Faders control region is visible, each track displays a **Pan** slider and a **Volume** fader.

To show or hide the Faders control region, click the **Faders** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

#### Adjusting panning

When the **Automation Settings** button ( ) is not selected, you can drag the **Pan** slider to control the position of the track in the stereo field: dragging to the left will place the track in the left speaker more than the right, and dragging to the right will place the track in the right speaker.

You can hold Ctrl while dragging the slider to adjust the setting in finer increments, or double-click the slider to return it to 0.

When the **Automation Settings** button ( ) is selected, the **Pan** slider handle is displayed with an automation icon ( ), and you can use it to edit pan automation.

**Note:** *The trim level is added to the pan automation settings so your panning envelope is preserved, but with an offset applied. For example, setting the trim control to 9% left has the same effect as moving every envelope point 9% to the left.*

#### Adjusting volume

When the **Automation Settings** button ( ) is not selected, you can drag the **Volume** fader to control the overall (trim) volume of the track.

You can hold Ctrl while dragging the slider to adjust the setting in finer increments, or double-click the slider to return it to 0.

When the **Automation Settings** button ( ) is selected, the Volume fader handle is displayed with an automation icon ( ), and you can use it to edit volume automation.

**Note:** *The trim level is added to the volume automation settings so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.*

## Using bus channel strips

A separate channel strip is displayed for each bus in your project.

To show or hide channel strips for busses, click the **Busses** button in the View Controls pane.

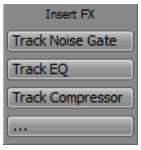
### Renaming a bus

To rename a bus, double-click the label at the bottom of the channel strip and type a new name in the box (or press F2 to rename the selected bus). The channel strip in the Mixing Console is updated when you press Enter.

### Adding or editing bus (insert) effects

When the Insert FX control region is visible, each bus displays its effects chain at the top of the channel strip.

To show or hide the Insert FX control region, click the **Insert FX** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*




Each effect is displayed as a button. You can hover over the button to see a ToolTip that displays the full plug-in and preset name.

> **Tip:** *When the Insert FX control region isn't visible, you can click the* **Edit Insert FX chain** *button (* *) in the Faders control region to display the Bus FX window for the bus effects chain.*

#### Adding a plug-in

Click the **Add New Insert FX** button ( ) and then choose a new plug-in from the menu to add a new plug-in to the effects chain.

#### Editing effects settings

Click an effect's button to display the Bus FX window, where you can adjust the plug-in's settings.

When you right-click an effect's button, a shortcut a menu is displayed:

- Choose **Show <Plug-In Name>** to open the Bus FX window, where you can adjust the plug-in's controls.

- Choose **Bypass <Plug-In Name>** to temporarily bypass a plug-in.

  When an effect is bypassed, its button is displayed in red text.

- Choose **Remove <Plug-In Name>** to remove a plug-in from the effects chain.
- Choose **Presets**, and then choose a setting from the submenu to load a new preset.
- To replace the current plug-in, right-click the effect's button, and then choose a new plug-in from the menu. Plug-ins are organized in submenus by type (EQ, Dynamics, Reverbs, etc.).

### Adjusting bus send levels

When the Sends control region is visible, each bus displays controls you can use to route the bus to assignable effects chains or to busses that are routed to hardware outputs.

To show or hide the Sends control region, click the **Sends** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

When the **Automation Settings** button ( ) in the Faders control region is not selected, click the **Channel Send** button and choose a bus or assignable effects chain from the menu, and then drag the fader to adjust the send level.

When the **Automation Settings** button ( ) in the Faders control region is selected, the fader handle is displayed with an automation icon ( ), and you can use it to edit send volume automation on the bus track.

**Note:** *The trim level is added to the automation settings so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.*

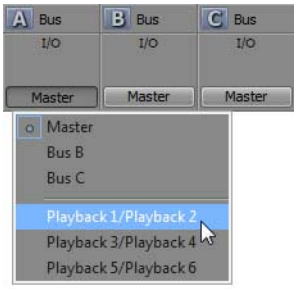
**Tip:** *To adjust the size of the Sends control region, you can drag the bottom divider to make more or fewer sends visible.*

Bus sends are post-volume (and post-mute) by default. To change to pre-volume (and pre-mute), click the **Pre/Post** button to switch to **Pre-Volume Send** mode.

### Changing a bus's output device

When the I/O control region is visible, each bus displays controls you can use to set the bus's output device.

To show or hide the I/O control region, click the **I/O** button in the View Controls pane.



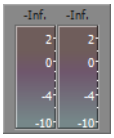
To choose an output device, click the **Output** button and choose a bus or hardware output from the menu.

**Important:** *When you route busses to hardware outputs, the outputs from those busses will not be included in the mix when you render your project.*

### Monitoring bus levels with VU/PPM meters

When the VU/PPM Meters control region is visible, you can display volume unit (VU) and peak program (PPM) meters to help you determine the perceived loudness of your audio signal (peak program meters provide faster response times to volume increases than VU meters).

To show or hide the VU/PPM Meters control region, click the **VU Meters** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*




Right-click the meter and choose a setting from the shortcut menu (or hover over the meter and roll your mouse wheel) to change the resolution and display options.

| Item | Description |
|---|---|
| **Show VU/PPM** | Use this command to show or hide meters for individual channels. |
| **Reset Clip** | Clears clipping indicators. |
| **Traditional VU** | The traditional VU meter is displayed with a scale of -10 dB to +2 dB. 0 dB on the VU meter equals 4 dBu. |
| **Extended VU** | The extended VU meter is displayed with a scale of -30 dB to +8 dB. 0 dB on the VU meter equals 4 dBu. |
| **Logarithmic VU** | Displays the meters in a logarithmic scale (like the Sound Forge peak meters) instead of the linear scales traditionally associated with VU meters. |
| **UK PPM** | The UK peak program meter (also known as a BBC meter) is a Type II meter and is displayed with a scale of 1 to 7, which corresponds to a range of -12 to 12 dBu: |

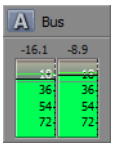
| **UK Marks** | **dBu** |
|---|---|
| 7 | 12 |
| 6 | 8 |
| 5 | 4 |
| 4 | 0 |
| 3 | 4 |
| 2 | 8 |
| 1 | -12 |

| | |
|---|---|
| **EBU PPM** | The EBU peak program meter is a Type II meter and is displayed with a scale of -12 to +12, which corresponds to -12 dBu to 12 dBu. 0 on the EBU PPM equals 0 dBu.<br>The EBU PPM and UK PPM respond identically to increases in volume, but the EBU PPM decays more slowly. |
| **DIN PPM** | The DIN peak program meter is a Type I meter and is displayed with a scale of -50 dB to +5 dB, which corresponds to -44 dBu to 11 dBu. 0 dB on the DIN PPM equals 6 dBu. |
| **Nordic PPM** | The Nordic peak program meter is a Type I meter and is displayed with a scale of -42 dB to +12 dB, which corresponds to -42 dBu to 12 dBu. 0 dB on the Nordic PPM equals 0 dBu. |
| **Show Labels** | Toggles the meter level labels on and off. |
| **Show Peaks** | Toggles peak level indicators on the top of the meter. |
| **Hold Peaks** | When selected, the highest peak levels are represented by a thin line on the meter. |
| **Hold Valleys** | When selected, the lowest peak levels are represented by a thin line on the meter. |
| **Vintage Mode** | When Vintage Mode is selected, the VU meters use a different calculation method to simulate the response of analog VU meters. |

### Monitoring bus levels with peak meters

When the Meters control region is visible, each bus displays meters you can use to monitor output levels.

To show or hide the Meters control region, click the **Meters** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*




**Note:** *If the Meters control region is not visible, peak meters are displayed in the Faders control region.*

Right-click the meter and choose a setting from the shortcut menu (or hover over the meter and roll your mouse wheel) to change the resolution and display options.

**Tip:** *Right-click the peak meters and choose* **Show Peak Meter** *to show or hide meters for individual channels.*

### Muting or soloing a bus

When the Faders control region is visible, each bus displays **Mute** ( ) and **Solo** ( ) buttons.

To show or hide the Faders control region, click the **Faders** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

#### Muting a bus

When the **Automation Settings** button ( ) is not selected, you can click the **Mute** button ( ) to prevent a bus from being played in the mix. Click the **Mute** button on additional busses to add them to the mute group. To unmute a bus, click the **Mute** button again.

When the **Automation Settings** button ( ) is selected, the **Mute** button is displayed with an automation icon ( ), and you can use the button to edit mute automation on the bus track.

#### Soloing a bus

Click the **Solo** button ( ) to mute all unselected busses. Click the **Solo** button on additional busses to add them to the solo group. To remove a bus from the solo group, click its **Solo** button again.

### Adjusting bus panning or volume

When the Faders control region is visible, each bus displays a **Pan** slider and a **Volume** fader.

> **Tip:** *The* **Pan** *slider is displayed only when a bus is routed to the master bus or an auxiliary bus. It is not available when the bus is routed directly to a hardware output.*

To show or hide the Faders control region, click the **Faders** button in the View Controls pane. *For more information, see* *The View Controls pane on page 196*.

#### Adjusting panning

When the **Automation Settings** button ( ) is not selected, you can drag the **Pan** slider to control the position of the bus in the stereo field: dragging to the left will place the bus in the left speaker more than the right, and dragging to the right will place the bus in the right speaker.

You can hold Ctrl while dragging the slider to adjust the setting in finer increments, or double-click the slider to return it to 0.

When the **Automation Settings** button ( ) is selected, the **Pan** slider handle is displayed with an automation icon ( ), and you can use it to edit pan automation on the bus track.

> **Note:** *The trim level is added to the pan automation settings so your panning envelope is preserved, but with an offset applied. For example, setting the trim control to 9 percent left has the same effect as moving every envelope point 9 percent to the left.*

#### Adjusting volume

When the **Automation Settings** button ( ) is not selected, you can drag the **Volume** fader to control the overall (trim) volume of the bus.

You can hold Ctrl while dragging the slider to adjust the setting in finer increments, or double-click the slider to return it to 0.

When the **Automation Settings** button ( ) is selected, the **Volume** fader handle is displayed with an automation icon ( ), and you can use it to edit volume automation on the bus track.

> **Note:** *The trim level is added to the volume automation settings so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.*

### Changing pre/post routing

The **Pre/Post-Fader Send** button in the Sends control region and the **Pre/Post Fader Insert FX** button ( ) in the Faders control region work together to determine the signal flow for your busses.

The **Pre/Post Fader Insert FX** button allows you to indicate whether the insert FX chain is affected by the channel's gain fader. When set to **Post Fader Insert FX** ( ), the FX chain is affected by the channel's gain. When set to **Pre Fader Insert FX** ( ), the FX chain is not affected by the channel's gain fader, which is essential on the master bus when using plug-ins that dither the audio for final rendering.

The **Pre/Post Fader Send** button allows you to create cue mixes that are not affected by the gain (or mute/pan) stages of the bus or track.

- When **Pre Fader Insert FX** ( ) and **Pre Fader Send** are selected, your audio signal flows as follows: bus effects — bus send — bus pan — bus volume.
- When **Pre Fader Insert FX** ( ) and **Post Fader Send** are selected, your audio signal flows as follows: bus effects — bus pan — bus volume — bus send.
- When **Post Fader Insert FX** ( ) and **Pre Fader Send** are selected, your audio signal flows as follows: bus send — bus pan — bus volume — bus effects.
- When **Post Fader Insert FX** ( ) and **Post Fader Send** are selected, your audio signal flows as follows: bus pan — bus volume — bus effects — bus send.

## Using input bus channel strips

A separate channel strip is displayed for each input bus in your project.

To show or hide channel strips for busses, click the **Busses** button in the View pane. *For more information, see The View Controls pane on page 196.*

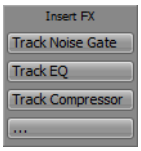
### Renaming an input bus

To rename an input bus, double-click the label at the bottom of the channel strip and type a new name in the box (or press F2 to rename the selected bus). The channel strip in the Mixing Console is updated when you press Enter.

### Adding or editing input bus (insert) effects

When the Insert FX control region is visible, each input bus displays its effects chain at the top of the channel strip.

To show or hide the Insert FX control region, click the **Insert FX** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*




Each effect is displayed as a button. You can hover over the button to see a ToolTip that displays the full plug-in and preset name.

**Tips:**

- *When the Insert FX control region isn't visible, you can click the* **Edit Insert FX Chain** *button (* *) in the Faders control region to display the Input Bus FX window for the bus effects chain.*
- *Input bus insert effects are always applied pre-fader.*

#### Adding a plug-in

Click the **Add New Insert FX** button ( ) and then choose a new plug-in from the menu to add a new plug-in to the effects chain.

#### Editing effects settings

Click an effect's button to display the Input Bus FX window, where you can adjust the plug-in's settings.

When you right-click an effect's button, a shortcut a menu is displayed:

- Choose **Show <Plug-In Name>** to open the Input Bus FX window, where you can adjust the plug-in's controls.

- Choose **Bypass <Plug-In Name>** to temporarily bypass a plug-in.

  When an effect is bypassed, its button is displayed in red text.

- Choose **Remove <Plug-In Name>** to remove a plug-in from the effects chain.
- Choose **Presets**, and then choose a setting from the submenu to load a new preset. The current preset is indicated by a check mark.
- To replace the current plug-in, right-click the effect's button, and then choose a new plug-in from the menu. Plug-ins are organized in submenus by type (EQ, Dynamics, Reverbs, etc.).

### Adjusting input bus send levels

When the Sends control region is visible, each bus displays controls you can use to route the input bus to assignable effects chains or to busses that are routed to hardware outputs. A bus cannot send to a bus that is directly or indirectly routed to the Master bus.

To show or hide the Sends control region, click the **Sends** button in the View Controls pane. *For more information, see The View Controls pane on page 196*.

When the **Automation Settings** button ( ) in the Faders control region is not selected, click the **Channel Send** button and choose a bus or assignable effects chain from the menu, and then drag the fader to adjust the send level.

When the **Automation Settings** button ( ) in the Faders control region is selected, the fader handle is displayed with an automation icon ( ), and you can use it to edit send volume automation on the bus track.

**Note:** *The trim level is added to the automation settings so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.*

**Tip:** *To adjust the size of the Sends control region, you can drag the bottom divider to make more or fewer sends visible.*

Bus sends are post-volume (and post-mute) by default. To change to pre-volume (and pre-mute), click the **Pre/Post** button to switch to **Pre-Volume Send** mode.

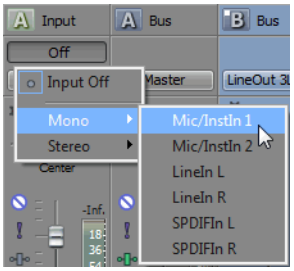
### Changing an input bus's input or output port

When the I/O control region is visible, each bus displays controls you can use to set the bus's input and output device.

To show or hide the I/O control region, click the **I/O** button in the View Controls pane. *For more information, see The View Controls pane on page 196*.

#### Choosing an input device

To choose an output device, click the **Input** button and choose a port from the menu.

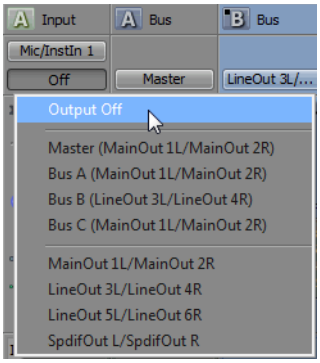


### Choosing an output device

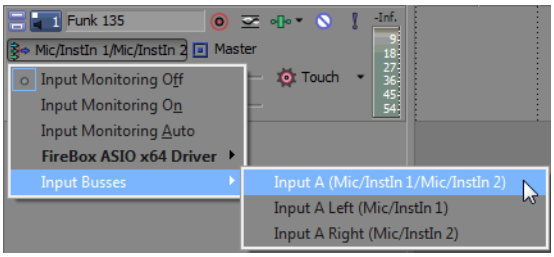
To choose an output device, click the **Output** button and choose a bus or hardware output from the menu, or choose **Output Off**.

Setting the output to **Output Off** is useful when you're using an input bus as a recording input and want to monitor the bus through the track or when using an input bus as a talkback mic.

**Important:** *When you route busses to hardware outputs, the outputs from those busses will not be included in the mix when you render your project.*



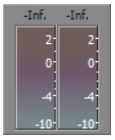

If you want to use an input bus as a track input, click the **Record Input** button on the track header, choose **Input Busses** from the menu, and choose an input bus from the submenu.




### Monitoring input bus levels with VU/PPM meters

When the VU/PPM Meters control region is visible, you can display volume unit (VU) and peak program (PPM) meters to help you determine the perceived loudness of your audio signal (peak program meters provide faster response times to volume increases than VU meters).

To show or hide the VU/PPM Meters control region, click the **VU Meters** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*




Right-click the meter and choose a setting from the shortcut menu (or hover over the meter and roll your mouse wheel) to change the resolution and display options.

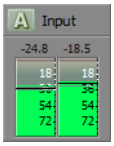
| Item | Description |
|---|---|
| **Show VU/PPM** | Use this command to show or hide meters for individual channels. |
| **Reset Clip** | Clears clipping indicators. |
| **Traditional VU** | The traditional VU meter is displayed with a scale of -10 dB to +2 dB. 0 dB on the VU meter equals 4 dBu. |
| **Extended VU** | The extended VU meter is displayed with a scale of -30 dB to +8 dB. 0 dB on the VU meter equals 4 dBu. |

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Logarithmic VU</td><td>Displays the meters in a logarithmic scale (like the Sound Forge peak meters) instead of the linear scales traditionally associated with VU meters.</td></tr>
<tr><td>UK PPM</td><td>The UK peak program meter (also known as a BBC meter) is a Type II meter and is displayed with a scale of 1 to 7, which corresponds to a range of -12 to 12 dBu:
<table>
<tr><th>UK Marks</th><th>dBu</th></tr>
<tr><td>7</td><td>12</td></tr>
<tr><td>6</td><td>8</td></tr>
<tr><td>5</td><td>4</td></tr>
<tr><td>4</td><td>0</td></tr>
<tr><td>3</td><td>4</td></tr>
<tr><td>2</td><td>8</td></tr>
<tr><td>1</td><td>-12</td></tr>
</table></td></tr>
<tr><td>EBU PPM</td><td>The EBU peak program meter is a Type II meter and is displayed with a scale of -12 to +12, which corresponds to -12 dBu to 12 dBu. 0 on the EBU PPM equals 0 dBu.<br>The EBU PPM and UK PPM respond identically to increases in volume, but the EBU PPM decays more slowly.</td></tr>
<tr><td>DIN PPM</td><td>The DIN peak program meter is a Type I meter and is displayed with a scale of -50 dB to +5 dB, which corresponds to -44 dBu to 11 dBu. 0 dB on the DIN PPM equals 6 dBu.</td></tr>
<tr><td>Nordic PPM</td><td>The Nordic peak program meter is a Type I meter and is displayed with a scale of -42 dB to +12 dB, which corresponds to -42 dBu to 12 dBu. 0 dB on the Nordic PPM equals 0 dBu.</td></tr>
<tr><td>Show Labels</td><td>Toggles the meter level labels on and off.</td></tr>
<tr><td>Show Peaks</td><td>Toggles peak level indicators on the top of the meter.</td></tr>
<tr><td>Hold Peaks</td><td>When selected, the highest peak levels are represented by a thin line on the meter.</td></tr>
<tr><td>Hold Valleys</td><td>When selected, the lowest peak levels are represented by a thin line on the meter.</td></tr>
<tr><td>Vintage Mode</td><td>When Vintage Mode is selected, the VU meters use a different calculation method to simulate the response of analog VU meters.</td></tr>
</table>

### Monitoring input bus levels with peak meters

When the Meters control region is visible, each input bus displays meters you can use to monitor output levels.

To show or hide the Meters control region, click the **Meters** button in the View Controls pane. *For more information, see* *The View Controls pane on page 196*.




**Note:** *If the Meters control region is not visible, peak meters are displayed in the Faders control region.*

Right-click the meter and choose a setting from the shortcut menu (or hover over the meter and roll your mouse wheel) to change the resolution and display options.

**Tip:** *Right-click the peak meters and choose* **Show Peak Meter** *to show or hide meters for individual channels.*

## Muting or soloing an input bus

When the Faders control region is visible, each input bus displays **Mute** ( ) and **Solo** ( ) buttons.

To show or hide the Faders control region, click the **Faders** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

### Muting an input bus

When the **Automation Settings** button ( ) is not selected, you can click the **Mute** button ( ) to prevent an input bus from being played in the mix. Click the **Mute** button on additional input busses to add them to the mute group. To unmute an input bus, click the **Mute** button again.

When the **Automation Settings** button ( ) is selected, the **Mute** button is displayed with an automation icon ( ), and you can use the button to edit mute automation on the bus track.

### Soloing an input bus

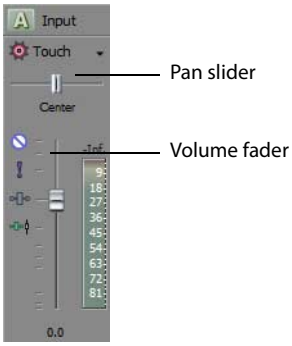
Click the **Solo** button ( ) to mute all unselected input busses. Click the **Solo** button on additional input busses to add them to the solo group. To remove an input bus from the solo group, click its **Solo** button again.

## Adjusting input bus volume or panning

When the Faders control region is visible, each input bus displays a **Pan** slider and a **Volume** fader.

> **Note:** *The* **Pan** *slider is displayed only when an input bus is routed to the master bus or an auxiliary bus. It is not available when the input bus is routed directly to a hardware output.*

To show or hide the Faders control region, click the **Faders** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*



#### Adjusting panning

When the **Automation Settings** button ( ) is not selected, you can drag the Pan slider to control the position of the bus in the stereo field. Dragging to the left will place the bus in the left speaker more than the right, and dragging to the right will place the bus in the right speaker.

You can hold Ctrl while dragging the slider to adjust the setting in finer increments, or double-click the slider to return it to 0.

When the **Automation Settings** button ( ) is selected, the Pan slider handle is displayed with an automation icon ( ), and you can use it to edit pan automation on the bus track.

> **Note:** *The trim level is added to the pan automation settings so your panning envelope is preserved, but with an offset applied. For example, setting the trim control to 9 percent left has the same effect as moving every envelope point 9 percent to the left.*

#### Adjusting volume

When the **Automation Settings** button ( ) is not selected, you can drag the Volume fader to control the overall (trim) volume of the bus.

You can hold Ctrl while dragging the slider to adjust the setting in finer increments, or double-click the slider to return it to 0.

When the **Automation Settings** button ( ) is selected, the Volume fader handle is displayed with an automation icon ( ), and you can use it to edit volume automation on the bus track.

> **Note:** *The trim level is added to the volume automation settings so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.*

### Changing input bus pre/post routing

Insert effects on input busses are always pre fader. The FX chain is not affected by the channel's gain fader.

The **Pre/Post Fader Send** button allows you to create cue mixes that are not affected by the gain (or mute/pan) stages of the bus or track.

- When **Pre Fader Send** is selected, your audio signal flows as follows: bus effects — bus send — bus pan — bus volume.
- When **Post Fader Send** is selected, your audio signal flows as follows: bus effects — bus pan — bus volume — bus send.

## Using FX send (assignable effects) channel strips

A separate channel strip is displayed for each FX send (assignable effects chain) in your project.

To show or hide channel strips for assignable effects, click the **FX Sends** button in the View Controls pane. *For more information, see* *The View Controls pane on page 196*.

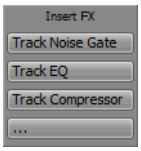
### Renaming an assignable effect chain

To rename an assignable effects chain, double-click the label at the bottom of the channel strip and type a new name in the box (or press F2 to rename the selected assignable effects chain). The channel strip in the Mixing Console is updated when you press Enter.

### Adding or editing effects

When the Insert FX control region is visible, each assignable effects chain displays its effects at the top of the channel strip.

To show or hide the Insert FX control region, click the **Insert FX** button in the View Controls pane. *For more information, see* *The View Controls pane on page 196*.




Each effect is displayed as a button. You can hover over the button to see a ToolTip that displays the full plug-in and preset name.

#### Adding a plug-in

Click the **Add New Insert FX** button (...) and then choose a new plug-in from the menu to add a new plug-in to the effects chain.

#### Editing effects settings

Click an effect's button to display the Assignable FX window, where you can adjust the plug-in's settings.

When you right-click an effect's button, a shortcut a menu is displayed:

- Choose **Show <Plug-In Name>** to open the Assignable FX window, where you can adjust the plug-in's controls.
- Choose **Bypass <Plug-In Name>** to temporarily bypass a plug-in.

  When an effect is bypassed, its button is displayed in red text.

- Choose **Remove <Plug-In Name>** to remove a plug-in from the effects chain.
- Choose **Presets**, and then choose a setting from the submenu to load a new preset.

- To replace the current plug-in, right-click the effect's button, and then choose a new plug-in from the menu. Plug-ins are organized in submenus by type (EQ, Dynamics, Reverbs, etc.)

### Adjusting assignable effects input levels

When the Sends control region is visible, each assignable effects chain displays controls you can use to adjust and monitor the input volume of the effects chain.

To show or hide the Sends control region, click the **Sends** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*

### Changing an effects chain's output device

When the I/O control region is visible, each assignable effects chain displays controls you can use to set the chain's output device.

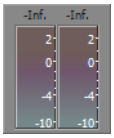
To show or hide the I/O control region, click the **I/O** button in the View Controls pane.

To choose an output device, click the **Output** button and choose a bus from the menu.

### Monitoring assignable effects levels with VU/PPM meters

When the VU/PPM Meters control region is visible, you can display volume unit (VU) and peak program (PPM) meters to help you determine the perceived loudness of your audio signal (peak program meters provide faster response times to volume increases than VU meters).

To show or hide the VU/PPM Meters control region, click the **VU Meters** button in the View Controls pane.




Right-click the meter and choose a setting from the shortcut menu (or hover over the meter and roll your mouse wheel) to change the resolution and display options.

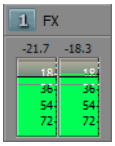
| Item | Description |
|---|---|
| **Show VU/PPM** | Use this command to show or hide meters for individual channels. |
| **Reset Clip** | Clears clipping indicators. |
| **Traditional VU** | The traditional VU meter is displayed with a scale of -10 dB to +2 dB. 0 dB on the VU meter equals 4 dBu. |
| **Extended VU** | The extended VU meter is displayed with a scale of -30 dB to +8 dB. 0 dB on the VU meter equals 4 dBu. |

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Logarithmic VU</td><td>Displays the meters in a logarithmic scale (like the Sound Forge peak meters) instead of the linear scales traditionally associated with VU meters.</td></tr>
<tr><td>UK PPM</td><td>The UK peak program meter (also known as a BBC meter) is a Type II meter and is displayed with a scale of 1 to 7, which corresponds to a range of -12 to 12 dBu:
<table>
<tr><th>UK Marks</th><th>dBu</th></tr>
<tr><td>7</td><td>12</td></tr>
<tr><td>6</td><td>8</td></tr>
<tr><td>5</td><td>4</td></tr>
<tr><td>4</td><td>0</td></tr>
<tr><td>3</td><td>4</td></tr>
<tr><td>2</td><td>8</td></tr>
<tr><td>1</td><td>-12</td></tr>
</table></td></tr>
<tr><td>EBU PPM</td><td>The EBU peak program meter is a Type II meter and is displayed with a scale of -12 to +12, which corresponds to -12 dBu to 12 dBu. 0 on the EBU PPM equals 0 dBu.<br>The EBU PPM and UK PPM respond identically to increases in volume, but the EBU PPM decays more slowly.</td></tr>
<tr><td>DIN PPM</td><td>The DIN peak program meter is a Type I meter and is displayed with a scale of -50 dB to +5 dB, which corresponds to -44 dBu to 11 dBu. 0 dB on the DIN PPM equals 6 dBu.</td></tr>
<tr><td>Nordic PPM</td><td>The Nordic peak program meter is a Type I meter and is displayed with a scale of -42 dB to +12 dB, which corresponds to -42 dBu to 12 dBu. 0 dB on the Nordic PPM equals 0 dBu.</td></tr>
<tr><td>Show Labels</td><td>Toggles the meter level labels on and off.</td></tr>
<tr><td>Show Peaks</td><td>Toggles peak level indicators on the top of the meter.</td></tr>
<tr><td>Hold Peaks</td><td>When selected, the highest peak levels are represented by a thin line on the meter.</td></tr>
<tr><td>Hold Valleys</td><td>When selected, the lowest peak levels are represented by a thin line on the meter.</td></tr>
<tr><td>Vintage Mode</td><td>When Vintage Mode is selected, the VU meters use a different calculation method to simulate the response of analog VU meters.</td></tr>
</table>

### Monitoring output levels with peak meters

When the Meters control region is visible, each assignable effects chain displays meters you can use to monitor output levels.

To show or hide the Meters control region, click the **Meters** button in the View Controls pane. *For more information, see The View Controls pane on page 196.*




**Note:** *If the Meters control region is not visible, peak meters are displayed in the Faders control region.*

Right-click the meter and choose a setting from the shortcut menu (or hover over the meter and roll your mouse wheel) to change the resolution and display options.

**Tip:** *Right-click the peak meters and choose* **Show Peak Meter** *to show or hide meters for individual channels.*

## Muting or soloing an assignable effects chain

When the Faders control region is visible, each assignable effects chain displays **Mute** ( ) and **Solo** ( ) buttons.

To show or hide the Faders control region, click the **Faders** button in the View Controls pane.

### Muting an assignable effects chain

When the **Automation Settings** button ( ) is not selected, you can click the **Mute** button ( ) to prevent an assignable effects chain bus from being played in the mix. Click the **Mute** button on additional chains to add them to the mute group. To unmute a chain, click the **Mute** button again.

When the **Automation Settings** button ( ) is selected, the **Mute** button is displayed with an automation icon ( ), and you can use the button to edit mute automation on the bus track.

### Soloing an assignable effects chain

Click the **Solo** button ( ) to mute all unselected assignable effects chains and busses. Click the **Solo** button on additional assignable effects chains or busses to add them to the solo group. To remove a chain from the solo group, click its **Solo** button again.

## Adjusting assignable effects panning or volume

When the Faders control region is visible, each bus displays a **Pan** slider and a **Volume** fader.

To show or hide the Faders control region, click the **Faders** button in the View Controls pane.

### Adjusting panning

When the **Automation Settings** button ( ) is not selected, you can drag the **Pan** slider to control the position of the bus in the stereo field: dragging to the left will place the bus in the left speaker more than the right, and dragging to the right will place the bus in the right speaker.

You can hold Ctrl while dragging the slider to adjust the setting in finer increments, or double-click the slider to return it to 0.

When the **Automation Settings** button ( ) is selected, the **Pan** slider handle is displayed with an automation handle ( ), and you can use it to edit pan automation on the bus track.

> **Note:** *The trim level is added to the pan automation settings so your panning envelope is preserved, but with an offset applied. For example, setting the trim control to 9% left has the same effect as moving every envelope point 9% to the left.*

#### Adjusting volume

When the **Automation Settings** button ( ) is not selected, you can drag the **Volume** fader to control the overall (trim) volume of the bus.

You can hold Ctrl while dragging the slider to adjust the setting in finer increments, or double-click the slider to return it to 0.

When the **Automation Settings** button ( ) is selected, the **Volume** fader handle is displayed with an automation icon ( ), and you can use it to edit volume automation on the bus track.

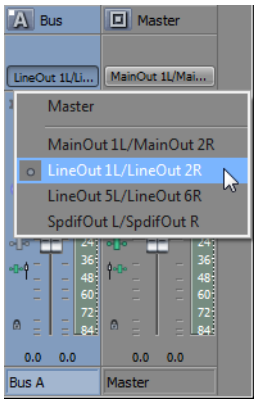
> **Note:** *The trim level is added to the volume automation settings so your envelope is preserved, but with a boost or cut applied. For example, setting the trim control to -3 dB has the same effect as decreasing every envelope point by 3 dB.*

## Using input busses with hardware-based effects

Plug-ins are great, but there are times when you may want the sound of a specific piece of hardware for your tracks. This section will show you how to use auxiliary busses and input busses to send a track to an external processor.

1. Connect your effects processor to your audio interface:
   a. Connect the input of your effects processor to an output from your sound card (for this example, we'll use **LineOut 1**).
   b. Connect the output of your effects processor to an input on your sound card (for this example, we'll use **Inst 1**).
2. Add a bus to your project. This bus will be used as a destination to send a track to your effects processor.
3. Configure your bus to send its output to your effects processor:

   In the I/O control region of the bus's channel strip, click the **Output** button and choose the output that is connected to your effects processor's input (**LineOut 1**/**LineOut 2** for this example).




This auxiliary bus provides a signal path to your effects processor's input.

4. Add an input bus to your project. This input bus will receive the signal from your effects processor.
5. Configure your input bus to take its input from the effects processor and send its output to your main mix:
   a. In the I/O control region of the input bus's channel strip, click the **Input Source** button and choose the sound card input that is connected to your effects processor's output (**Inst 1** for this example).

**b.** Click the **Output** button and choose the output where you want to send your processed signal. We'll send this signal to the master bus so it is included with your main mix and will be included when performing a real-time render.

This input bus provides a signal path from your effects processor's output to your project.

**6.** Send your track to the effects processor:

Click the bus button on the track header and choose the bus you created in step 2.

The bus button on the track header lets you send the track's audio to your effects processor.

**7.** Click **Play** ( ).

When you play your project, the track is sent to your auxiliary bus, into the effects processor, out of the effects processor into the input bus, and out to the master bus.

**8.** When you're ready to render your project, you can use real-time rendering to include the output from your effects processor with your project. *For more information, see Rendering in real time on page 376.*

## Monitoring an external source without mixing it with your project

You may not want every signal that goes through the Mixing Console to be mixed with your project. For example, you could set up a cue (talkback) microphone to communicate between the control room and recording booth.

This section will show you how to use an input bus to set up a cue microphone.

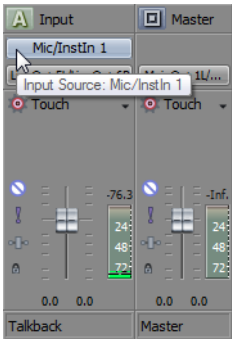
**1.** Add an input bus to your project.

**2.** Connect a microphone to an input on your sound card (for this example, we'll use **Mic/Inst 1**).

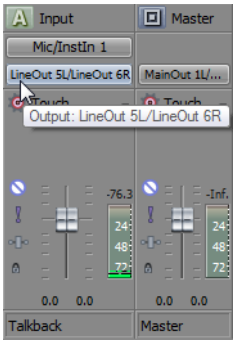
**3.** In the recording booth, connect a pair of powered speakers or a headphone amplifier to an output on your sound card (for this example, we'll use **LineOut 3L/LineOut 4R**).

**4.** Set up your input bus:

**a.** In the I/O control region of the input bus channel strip, click the **Input Source** button and choose the sound card input where your cue microphone is connected.



b. Click the **Output** button and choose the sound card output where your speaker or headphone amplifier is connected.



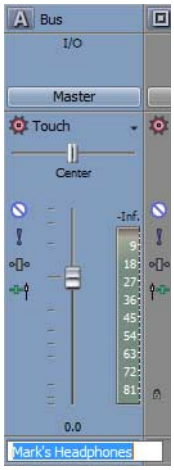

When you speak into the cue microphone, its output is sent to the recording booth without being mixed into your project output.

## Creating a Cue (Headphone) Mix with the Mixing Console

When you're recording, you'll often need to create separate monitor mixes: the performer in the recording booth may need a slightly different mix than you're listening to in the control room. The flexibility of the Mixing Console makes it easy to create custom cue mixes.

When you start a new project, all audio tracks are routed to the master bus. Let's assume that you're using the master bus for your main mix. If you have a sound card with multiple hardware outputs, you can create alternative mixes that you can send to hardware outputs without changing your main mix.

1. First, go to the **Audio Device** tab in the Preferences dialog and ensure you have a multiple-output device selected in the **Audio device type** drop-down list. *For more information, see Audio Device tab on page 424.*
2. On the **Audio** tab of the Preferences dialog, clear the **Track prefader sends listen to mute** check box. *For more information, see Audio tab on page 423.*
3. If the Mixing Console isn't already visible, choose **Mixing Console** from the **View** menu.
4. First, let's click the **Insert Bus** button ( ) in the Mixing Console window to create a new bus for our alternative mix.
5. By default, the bus is named Bus A. Let's double-click the bus label in the mixer window and type "Mark's Headphones" in the box to give our bus a more descriptive name.



6. Now we need to route our headphone bus to one of our sound card's outputs.

   a. In the Mixing Console, click the **Output** button in the I/O control region on the cue mix bus. A menu is displayed that lists all of our sound card's outputs.

> **Tip:** *To show or hide the I/O control region, click the* **I/O** *button in the View Controls pane.*

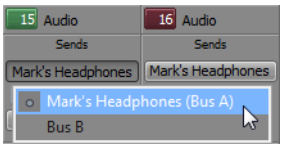
   b. Choose the output where you want to send the headphone mix.

   c. Connect the performer's headphones to the selected output.

7. Now we need to create our headphone mix.

   a. If the Sends control region isn't already visible, click the **Sends** button in the View Controls pane. Notice that each track now has a send for Mark's Headphones (Bus A).

   If you have multiple busses in your project, you can adjust the height of the Sends control region until all sends are visible, or you can click the **Channel Send** button for each track and choose **Mark's Headphones (Bus A)** from the menu.




   b. Click the **Pre/Post** in each track's Sends control region to select **Pre Volume Send** mode. When bus sends are pre-volume, the cue mix is independent of the main mix.

   c. Drag the fader on each track's channel strip to adjust the level of the track that is sent to the headphone mix bus. If multiple tracks are selected, you can adjust their bus-send levels at the same time.

   Right-click the bus send fader in the track header in the main application window and choose **Link to Main Track Pan** from the shortcut menu. When this command is selected, track panning is applied to bus sends (including pan position and panning mode). When **Link to Main Track Pan** is not selected, the track sends a center-panned stereo signal using the track's current panning mode.

   If you want to exclude a track from the headphone mix, just set its send to **-Inf**.

   You can use the channel strip for the headphone mix bus in the Mixing Console window to adjust the level of the headphone mix, add effects to the mix, or mute and solo the mix. *For more information, see Using bus channel strips on page 207.*

   If you need to create multiple mixes, you can add up to 26 busses to the Mixing Console window and repeat the procedure described in this section.

Chapter 12

# Adding Audio Effects

You can use audio effects, or plug-ins, to improve the quality of the audio in a production or to create special artistic effects. Vegas® Pro software supports a variety of DirectX® and VST plug-in effects from both Sony Creative Software Inc. and third-party vendors.

**Important:** *Be aware that using non-in-place plug-ins (such as Time Stretch, Pitch Shift without preserving duration, and some Vibrato settings) will cause audio to play out of synchronization with the waveform display in the timeline and with other tracks. If an effects chain includes non-in-place plug-ins, the effects chain icon will be displayed in yellow ( ) to indicate that automatic plug-in delay compensation is being used.*

*When input monitoring is on during audio recording, plug-in chains that cannot be used for live monitoring are automatically bypassed and are displayed in red ( ).*

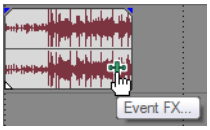
## Using audio effects

There are four ways to use audio effects: event effects, track effects, bus effects, and assignable effects. The combination of these various methods of applying audio effects is important to the final mix of a project. *For more information, see Audio signal flow on page 35.*

- **Event effects** are applied to events on the timeline.
- **Track effects** are applied to all events in a single track.
- **Bus effects** are applied to a bus (including the Master bus). When you add plug-ins to a bus, the tracks that are assigned to the bus are processed by the plug-ins. Since multiple tracks can be assigned to a single bus, using bus-level audio effects is an efficient method of applying carefully customized chains of audio effects to multiple tracks. If plug-ins are assigned at the track level, the track's signal flows through the track's plug-ins before the bus plug-ins.
- **Assignable effects** allow you to send various levels of multiple tracks to a single effect chain. Like busses, these controls reside in the Mixing Console and support plug-in chains. In addition, assignable effects outputs can be routed to busses. Click the **Insert Assignable FX** button ( ) in the Mixing Console to add an assignable effect chain to your project. *For more information, see Using FX send (assignable effects) channel strips on page 219.*

## Adding audio event effects

From the **Tools** menu, choose **Audio**, and choose **Audio Event FX** from the submenu to apply or edit DirectX or VST plug-ins at the event level. Event-level plug-ins are applied only to the event where they are applied.




### Creating an event effects chain

1. Click the **Event FX** button ( ) on the event where you want to add effects (or select the event and choose **Tools** > **Audio** > **Audio Event FX**). The Audio Event FX window is displayed.

   The **Event FX** button is displayed in gray when an event does not have effects assigned. When no effects exist on an event, clicking the **Event FX** button displays the Plug-In Chooser.
2. Click the **Plug-In Chain** button ( ) to display the Plug-In Chooser.
3. Select each plug-in you want to add and click the **Add** button, or browse to an FX package. The plug-ins appear at the top of the window in the order in which you added them.

> **Tip:** *To reorder the plug-ins within the chain, drag a plug-in button to a new location, or click the* **Move Plug-In Left** *( ) or* **Move Plug-In Right** *( ) buttons.*

4. Once you have added all of the plug-ins and specified the plug-in chain order, click the **OK** button. The Audio Event FX window is displayed to allow you to edit the chain.

### Editing an event effects chain

When you click the **Event FX** button ( ) on an event, the Audio Event FX window is displayed to enable/bypass effects, edit effect parameters, and add/remove effects from a chain. *For more information, see* *Editing audio effects on page 232*.

## Adding audio track effects

From the **Tools** menu, choose **Audio**, and choose **Track FX** from the submenu to apply or edit DirectX or VST plug-ins at the track level. Track-level plug-ins are applied to every event on the selected track.

**Tip:** *To add effects quickly, you can drag plug-ins and plug-in packages from the Plug-In Manager window to an audio track header.*

### Creating a track effects chain

1. Click the **Track FX** button ( ) on the track where you want to add effects. The Audio Track FX window is displayed.

   The **Track FX** button is displayed in gray when a track does not have effects assigned. When no effects exist on a track, clicking the **Track FX** button displays the Plug-In Chooser.
2. Click the **Plug-In Chain** button ( ) to display the Plug-In Chooser.
3. Select each plug-in you want to add and click the **Add** button, or browse to an FX package. The plug-ins appear at the top of the window in the order in which you added them.

**Tip:** *To reorder the plug-ins within the chain, drag a plug-in button to a new location, or click the* **Move Plug-In Left** *( ) or* **Move Plug-In Right** *( ) buttons.*

4. Once you have added all of the plug-ins and specified the plug-in chain order, click the **OK** button. The Audio Track FX window is displayed to allow you to edit the chain.

**Tip:** *If you're working with a 5.1 surround project, you can use distinct plug-in settings for each channel (separate EQ settings for the front and surround speakers, for example) using effect automation. Add multiple instances of the plug-in to the track effects chain and select the* **Enable** *check boxes in the FX Automation Chooser for the channels you want each instance of the plug-in to affect. For more information, see* *Effect automation (audio only) on page 166*.

### Editing a track effects chain

When you click the **Track FX** button ( ) on a track, the Audio Track FX window is displayed to enable/bypass effects, edit effect parameters, and add/remove effects from a chain. *For more information, see* *Editing audio effects on page 232*.

### Automating track effect parameters

If a plug-in supports it, you can use envelopes to automatically adjust effect parameters over time. Automation envelopes can be added to tracks and bus tracks to control individual effect parameters for track effects, bus effects, and assignable effects. *For more information, see* *Effect automation (audio only) on page 166*.

## Adding bus effects

In addition to assigning effects to individual tracks, you may also apply DirectX and VST effects to busses.

Bus effects will be applied to all tracks assigned to that bus. If a track contains track effects and bus effects, track effects will be processed before the bus effects. *For more information, see* *Audio signal flow on page 35*.

**Tip:** *To specify whether the bus level is applied before or after the bus effects chain, do one of the following:*

- *Click the* **Pre/Post Fader Insert FX** *button (* *) in the Faders control region of the bus channel strip.*
- *Right-click the* **Track FX** *button (* *) button in the bus track or bus control and choose* **Post Volume** *from the shortcut menu if you want to apply the effects chain after the bus volume. This has the same effect as right-clicking the bus output fader and choosing* **Pre FX** *from the shortcut menu.*

When you're working with 5.1 surround projects, the Master bus supports 5.1-channel audio effects.

**Tips:**

- *To add effects quickly, you can drag plug-ins and plug-in packages from the Plug-In Manager window to busses in the Mixing Console window or a bus track header.*
- *If you want to add effects to all audio in your project, you can add effects to the Master bus.*

**Important:** *When input monitoring is on during audio recording, audio effects chains that contain non-in-place plug-ins are displayed in yellow (* *) to indicate that automatic plug-in delay compensation is being used. Chains that cannot be used for live monitoring are automatically bypassed and are displayed in red (* *).*

### Applying effects to a bus

1. Click the **Bus FX** button ( ) located on the bus's audio bus track. The Plug-in Chooser window appears.

   **Tip:** *You can also use the Insert FX control region in the bus channel strip to add or edit bus effects. For more information, see Adding or editing bus (insert) effects on page 207.*

2. Select each plug-in you want to add and click the **Add** button, or browse to an FX package.

   **Tip:** *To reorder the plug-ins within the chain, simply drag a plug-in button to a new location, or click the* **Move Plug-In Left** *(* *) or* **Move Plug-In Right** *(* *) buttons.*

3. When you have finished adding the plug-ins, click the **OK** button.

### Editing effects on a bus

1. Click the **Bus FX** button ( ) located on the audio bus track. If the bus has an effects chain, the Bus FX window is displayed.
2. Use the Bus FX window to enable/bypass effects, edit effect parameters, and add/remove effects from a chain.

**Tip:** *You can also use the Insert FX control region in the bus channel strip to add or edit bus effects. For more information, see Adding or editing bus (insert) effects on page 207.*

### Automating effect parameters

If a plug-in supports it, you can use envelopes to automatically adjust effect parameters over time. Automation envelopes can be added to tracks and bus tracks to control individual effect parameters for track effects, bus effects, and assignable effects. *For more information, see Effect automation (audio only) on page 166.*

## Adding assignable effects

From the **Insert** menu, choose **Audio Assignable FX** (or click the **Insert Assignable FX** button ( ) in the Mixing Console toolbar) to create an effects chain to which you can route tracks in your project.

You can create up to 32 assignable effects chains in your project, and each chain can contain up to 32 effects.

### Creating an assignable effects chain

1. From the **Insert** menu, choose **Audio Assignable FX** from the submenu. The Plug-In Chooser window appears.
2. Click each plug-in you want to add, and click the **Add** button, or browse to an effects package. The plug-ins appear at the bottom of the window in the order in which you added them.

> **Tip:** *To reorder the plug-ins within the chain, simply drag a plug-in button to a new location, or click the* **Move Plug-In Left** ( ) *or* **Move Plug-In Right** ( ) *buttons.*

3. Once you have added all of the plug-ins and specified the plug-in chain order, click the **OK** button. The new chain is added to the Mixing Console window, and the Assignable FX window appears.
4. Adjust the settings for the effects. For more information about using specific plug-ins, click the **Plug-In Help** button ( ).

When you create an assignable effects chain for your project, the **Remove Assignable FX** command is enabled on the **Tools** > **Audio** submenu so you can delete a chain from the project.

> **Tip:** *If the Mixing Console window is visible, click the* **Insert Assignable FX** *button ( ) in the toolbar.*

### Edit an assignable effects chain

1. Click the **Assignable FX** button ( ) located on the effect chain's audio bus track. The Assignable FX window is displayed.
2. Use the Assignable FX window to enable/bypass effects, edit effect parameters, and add/remove effects from a chain. *For more information, see* *Editing audio effects on page 232*.

> **Tip:** *If the Mixing Console window is visible, you can use the Insert FX control region in the assignable effects channel strip to edit the assignable effects chain. For more information, see* *Adding or editing effects on page 219*.

### Delete an assignable effects chain

When you remove an assignable effects chain, it is deleted from the project. You must recreate the chain if you want to use it again. If you want to keep the chain, but do not want to use it in your current project, you may save the chain as a preset.

> **Tip:** *To bypass an assignable effects chain without removing it from the project, select the* **Mute** *button ( ) in the Faders control region of the assignable effects channel strip. For more information, see* *Muting or soloing an assignable effects chain on page 222*.

Right-click an assignable effects channel strip in the Mixing Console window and choose **Delete** from the shortcut menu, or select an assignable effects channel strip and press the Delete key.

### Automate effect parameters

If a plug-in supports it, you can use envelopes to automatically adjust effect parameters over time. To automate assignable effects, add automation envelopes to the assignable effect's audio bus track. *For more information, see* *Assignable effects automation (audio only) on page 165*.

## Learn more about a specific audio effect

For more information about using specific audio effects, click the **Plug-In Help** button (?) in the audio effects window to display the plug-in's help file.

## Editing audio effects

Audio effect settings are displayed when you click the **FX** button ( ) on a track, bus, or Assignable FX control.

Use the effects window to enable/bypass effects, edit effect parameters, add/remove DirectX and VST effects from tracks, busses, and assignable FX chains, edit effect parameters, and configure effects automation.

**Note:** *If no effects have been added to a track or bus, the button is displayed in gray ( ). Click the button to display the Plug-In Chooser, where you can select the plug-ins you want to use.*

**Tips:**

- *To move faders and sliders in fine increments, hold Ctrl while dragging the control.*
- *Double-click the title bar of the audio effects window to resize the window for the current plug-in.*

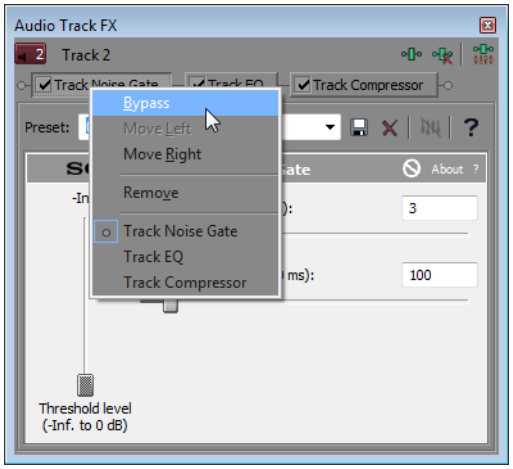
### Enabling or bypassing effects

Select the check box for each plug-in you want to apply or clear a check box to bypass an effect without removing it from the chain.

**Tip:** *The effect of plug-ins on a chain is cumulative, so you may need to rearrange the plug-ins so that one plug-in's processing does not adversely affect other plug-ins in the chain. To reorder the plug-ins within the chain, drag a plug-in button to a new location.*

Effect enabled | Effect bypassed

To enable the plug-in again, select its check box or choose **Bypass** from the shortcut menu.




**Tip:** *You can bypass or enable all plug-ins by right-clicking the ( ) button in the track list and choosing* **Enable All** *or* **Bypass All** *from the shortcut menu.*

### Editing effect parameters

Click the plug-in's button to select it, and use the bottom half of the window to adjust the effect's parameters. For more information about using specific plug-ins, click the **Plug-In Help** button (?).

### Adding or removing effects

1. Click the **Plug-In Chain** button ( ) to display the Plug-In Chooser.
2. Select a plug-in button, and then click the **Add** or **Remove** button. The modified chain is displayed at the top of the window.
   - Effects that can be automated are indicated by the red icon ( ) in the Plug-In Chooser.
   - VST plug-ins are indicated by the VST icon ( ) in the Plug-In Chooser.
   - If you select a plug-in package, that chain will replace the current chain.
3. Click the OK button.

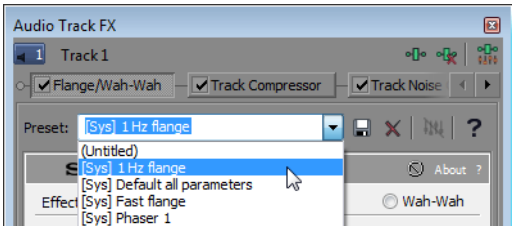
**Tips:**

- *You can bypass, enable, or delete all plug-ins in the chain by right-clicking the ( ) button in the track list.*
- *You can remove a plug-in from the Audio Plug-In dialog by selecting a plug-in and clicking the* **Remove Selected Plug-In** *button ( ).*

### Loading a plug-in preset

#### Loading a preset for an individual DirectX plug-in

Choose a setting from the **Preset** drop-down list. The plug-in settings stored in the preset are loaded.




#### Loading a preset for an individual VST plug-in

1. Click the **Open VST Preset** button ( ).

   The Open VST Preset dialog is displayed.
2. Browse to the .fxp file that you want to use.
3. Click the **Open** button.

   The current VST preset is replaced with the settings stored in the .fxp file.

#### Loading a bank of VST plug-in presets

1. Click the **Open VST Bank** button ( ).

   The Open VST Preset Bank dialog is displayed.
2. Browse to the .fxb file that you want to use.
3. Click the **Open** button.

   All presets for the current VST plug-in are replaced with the settings stored in the .fxb file, and the first preset in the bank is loaded by default.

## Creating or deleting a preset

### Saving a preset for an individual DirectX plug-in

1. Adjust the settings for the plug-in.
2. Type a name in the **Preset** box.
3. Click the **Save Preset** button ( ). The settings for the current plug-in are saved.

### Saving a preset for an individual VST plug-in

1. Type a name in the **Preset** box.
2. Click the **Save VST Preset As** button ( ).
   The Save VST Preset dialog is displayed.
3. Browse to the folder where you want to save the .fxp file and type a name in the **File name** box.
4. Click the **Save** button. The current plug-in settings are saved in the .fxp file.

### Saving a bank of VST plug-in presets

1. Click the **Save VST Bank As** button ( ).
   The Save VST Preset Bank dialog is displayed.
2. Browse to the folder where you want to save the .fxb file and type a name in the **File name** box.
3. Click the **Save** button. All presets for the current plug-in are stored in the bank.

### Deleting a preset

Choose a preset from the **Preset** drop-down list and click the **Delete** button ( ).

**Notes:**

- *You cannot delete built-in presets.*
- *VST plug-in settings are loaded or saved using .fxp and .fxb files as described above. Individual presets and banks cannot be deleted from the audio effects window.*

## Automating effect parameters

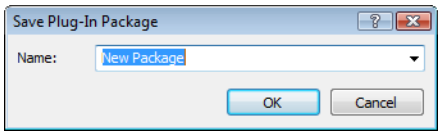
If a plug-in supports it, you can use envelopes to automatically adjust effect parameters over time. Automation envelopes can be added to tracks and bus tracks to control individual effect parameters for track effects, bus effects, and assignable effects. *For more information, see Effect automation (audio only) on page 166.*

## Creating and using effects packages

An effects package allows you to quickly recall frequently used chains of effects. FX packages retain their chain order and individual plug-in settings.

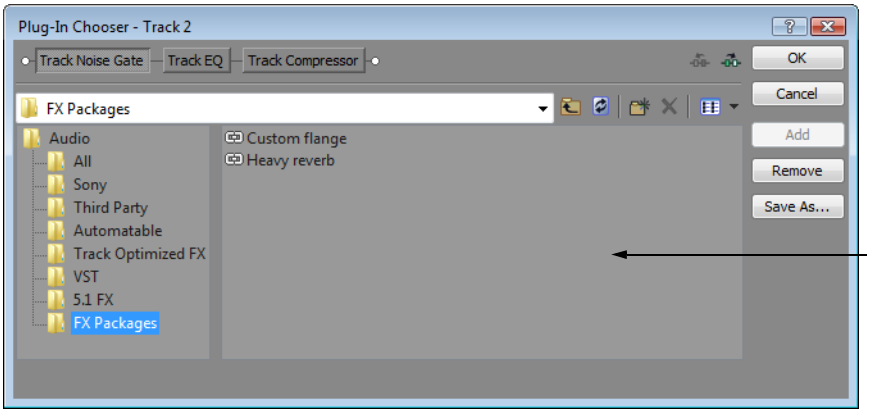
### Saving an FX chain as a preset

1. Click the **Plug-In Chain** button ( ) on the Track FX, Bus FX, or Assignable FX dialog to display the Plug-In Chooser window.
2. Use the Plug-In Chooser to add, remove, or arrange plug-ins.
3. Click the **Save As** button.
4. Enter a name on the Save Plug-In Package dialog and click **OK**.




### Using an FX chain preset

1. Click the **FX Chain** button ( ) on the Track FX, Bus FX, or Assignable FX dialog to display the Plug-In Chooser window.
2. In the Plug-In Chooser, browse to the preset package you want to recall.
3. Click **OK** to load the effects and settings from the package.



## Applying non-real-time event effects

Most processing in Vegas Pro is nondestructive: editing events and adding effects does not modify your source media.

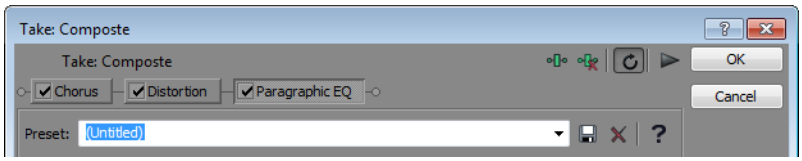
You can use non-real-time event effects to add effects to an event and render a new media file that includes the processed audio. Non-real-time effects are useful for large projects or for processor-intensive plug-ins.

**Tip:** *To add effects quickly, you can drag plug-ins and plug-in packages from the Plug-In Manager window to an event in the timeline.*

1. Select the event that contains the take you would like to process.
2. From the **Tools** menu, choose **Audio**, then **Apply Non-Real-Time Event FX**. The Plug-In Chooser dialog appears.
3. Select each plug-in you want to add and click the **Add** button.

**Tip:** *To reorder the plug-ins within the chain, drag a plug-in button to a new location, or click the* **Move Plug-In Left** *(* *) or* **Move Plug-In Right** *(* *) buttons.*

4. Click the **OK** button. The Take dialog is displayed with the settings for the first plug-in of the chain.




5. Adjust the settings for each effect. Click the **Plug-In Help** button ( ) within the FX window for information about each plug-in's settings. You can preview the processed audio by clicking the **Preview** button ( ).
6. When you have finished adjusting the effect settings, click the **OK** button. The Apply Non Real-Time FX dialog appears.
7. Specify a file name and format for the new media file.
8. Click the **Render** button. After processing, a new file is added to the Project Media window and a new take is added to the event.

## Bypassing all audio effects

From the **Options** menu, choose **Bypass All Audio FX** to omit all audio effects (track, bus, and assignable effects) during playback.

Bypassing effects allows you to quickly compare your project with and without effects and conserve processing power to avoid playback problems.

When effects are bypassed, you can choose whether bypassed effects remain open. When the **Keep bypassed FX running** check box on the **General** tab of the Preferences dialog is selected, effects remain open so you can bypass/enable effects with no pause for A/B testing. When the check box is cleared, effects are fully bypassed, conserving processing power.

Chapter 13

# Recording Audio

Vegas® Pro software can record audio into multiple mono or stereo audio tracks while simultaneously playing back existing audio and video tracks. You are limited only by the performance of your computer system and audio hardware. Audio is recorded to a media file on your computer and into an event on the timeline. You can record into an empty track, a time selection, an event, or a combination of time and event selection. Audio output from your computer during recording is not necessarily recorded with the new audio.

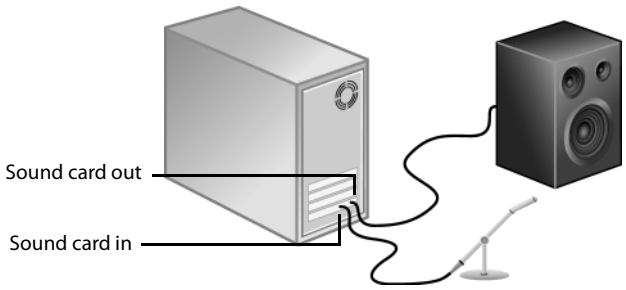
Recording does not alter any of the source media files in your project. Even when recording into an existing event, you are not overwriting the data in that event. Instead, the data is recorded into a new take for that event and saved to a media file on your hard drive.

## Setting up your equipment

There are numerous ways to connect your equipment to your system. Refer to your equipment's documentation for specific setup instructions. The following are some possible general configurations.

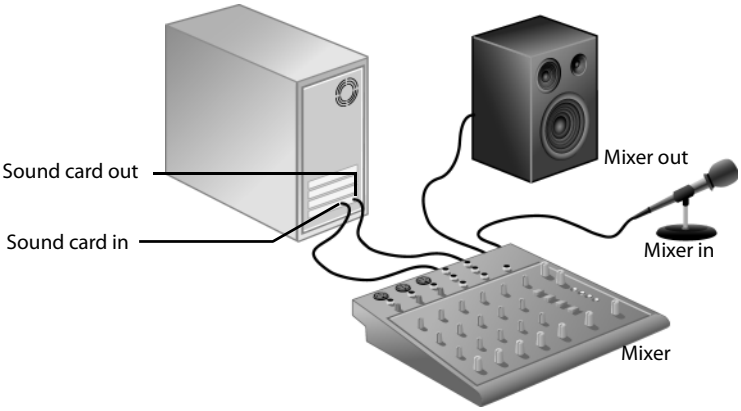
### Basic setup

This setup includes a simple microphone and speaker that are connected to the computer's sound card. With a more sophisticated microphone, you would typically want to use a preamplifier for input to the sound card.



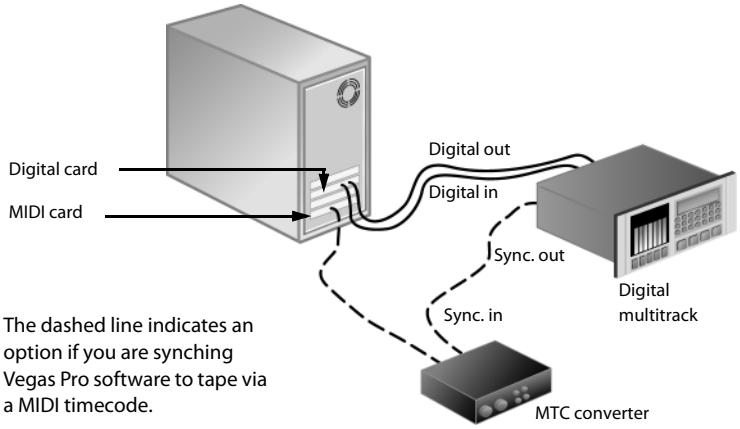

### Setup with mixer

This setup includes a mixer where the speaker and microphone connect. The mixer is then connected to the computer's sound card. Mixers usually have pre-amps built into them. This diagram does not show you an instrument or a physical preamplifier, such as a rack-mounted component. The reason for this omission is because these types of setups vary widely based on your mixer, instrument, and pre-amp type. Refer to your components' documentation for specific setup configurations.



### Setup with digital multitrack

This setup includes a digital multitrack recorder with an optional MIDI synchronization component. Usually you would have a mixer, a microphone, etc. connected to these components. Your particular setup will vary depending on your equipment. Refer to your components' documentation for specific setup configurations.




#### Synchronizing MIDI timecode

Vegas Pro software can generate (output) MIDI timecode to synchronize external devices with project playback or can be triggered by MIDI timecode generated by an external device. To output MIDI, from the **Options** menu, choose **Timecode**, and choose **Generate MIDI Timecode** from the submenu. To allow Vegas Pro software to be triggered by an external MIDI device, choose **Trigger from MIDI Timecode** from the same submenu. *For more information, see Triggering from MIDI timecode on page 241 and Sync tab on page 429.*

## Preparing to record

Before you record, you must arm the tracks into which you will record the new audio. You must also select the recording settings for the tracks. You have the additional options of using a metronome or turning off playback during recording.

You can record into an empty track, a time selection, an event, or a combination of time and event selection. You can also record multiple takes for an event so you can maintain multiple versions of an event that you can play back and edit.

**Tips:**

- *Select a media bin before recording if you want to automatically add your recorded audio to a media bin.*
- *To save track effects with your recorded files, create an effects package of the track effect settings and apply the chain to the event as a non-real time event effect.*
- *Press Alt+Down Arrow during playback to move the edit cursor to the playback cursor.*
- *When the* **Record to Broadcast Wave Format** *check box is selected on the* **Audio** *tab of the Preferences dialog, Vegas Pro records Broadcast Wave Format (.bwf) metadata when recording .wav files. You can view this information on the* **General** *tab of the Properties dialog for an event. For more information, see Audio tab on page 423 and Modifying media file properties on page 284.*

  *Included in the .bwf metadata is a* **Time reference** *value. This item tracks where on the timeline the file was recorded. When you import a recorded .bwf file, it is added to the timeline at the same location it was originally recorded.*

  *The originator (Vegas) and originator reference (a unique ID number), are also recorded.*

**Important:** *When input monitoring is on during audio recording, track effect chains that may delay the audio signal are displayed in yellow ( ). Chains that cannot be used for live monitoring are automatically bypassed and are displayed in red ( ).*

### Arming the track for recording

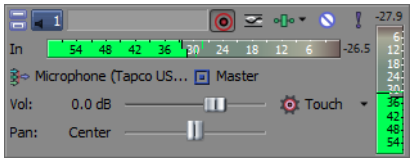
Whether recording into an existing track, an empty track, a selected event, or a time selection, you must prepare a track for recording. You can arm multiple tracks prior to recording.

Click the **Arm for Record** button ( ) in the track header.

After a track is armed, a record meter appears in the track header. Depending on your hardware, a record gain fader may also appear.

Arm the track first.

Track is ready for recording using the Sound Mapper.




Track is ready for recording from a specific device.

### Using the metronome

A built-in metronome marks time to help with the timing and tempo when recording a performance. The metronome's sound is not mixed in the final rendering of the project. Use the Preview fader in the Master Bus window to control the metronome volume. *For more information, see Master Bus window on page 191.*

To use the metronome, from the **Options** menu, choose **Metronome**.

> **Tip:** *You can customize the sound of the metronome in the* **Audio** *tab of the Preferences dialog. For more information, see Audio tab on page 423.*

## Recording

You can record into an empty track, a time selection, an event, or a combination of time and event selection. The recording is added to the timeline as new take and saves it to a media file on your hard drive.

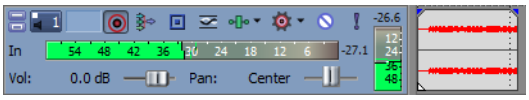
Triggering recording from MIDI timecode is also supported.

### Recording into an empty track

1. Select a track. Alternately, to record to a new track, choose **Audio Track** from the **Insert** menu.
2. Place the cursor on the timeline where you want to begin recording.
3. Arm the track by clicking the **Arm for Record** button ( ) on the track.

   If this is the first time you arm a track for recording in this project, you will be prompted to identify the location where the new audio files will be saved. *For more information, see Arming the track for recording on page 239.*
4. Start recording by clicking the **Record** button ( ) on the transport bar.

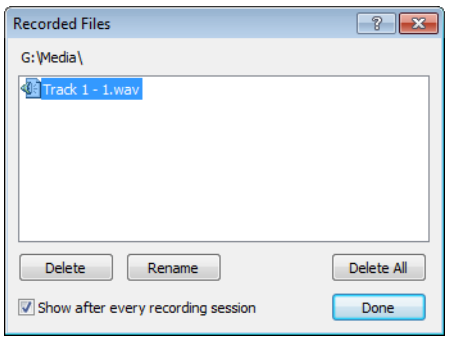
   Depending on the recording selection, a waveform is created along the timeline as you record into the armed track(s).




Recorded waveform

5. Stop recording by clicking the **Record** button ( ) again or the **Stop** button ( ) on the transport bar.

6. A small dialog opens displaying the name and location of the file or files that were just created. Click **Done** to return to the main workspace.

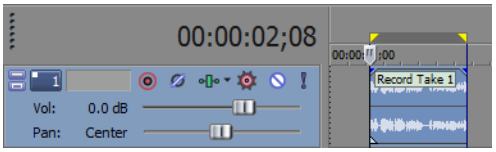



| Item | Description |
|---|---|
| Delete button | Removes the selected file. |
| Rename button | Changes the name of the selected file. |
| Delete All button | Removes all files listed in the dialog. |
| Done button | Closes the dialog and returns you to the timeline. |
| Show after every recording session check box | When this check box is selected, Vegas Pro software displays this dialog after each recording session. |

**Note:** *The Recorded Files dialog does not appear if you are triggering from MIDI timecode, as this would interrupt the synchronizing. Instead, files are automatically named and saved according to your preferences.*

### Recording into a time selection

By making a time selection, you specify where along the timeline to record. The time selection also determines how long the software records. Any selected events that occur within the time selection are split and the recorded data is placed into the time selection.




Recorded waveform

The event's waveform is displayed as it is recorded and automatically stops recording when the cursor reaches the end of the time selection.

### Recording into an event

By recording into an event, you automatically create a new take containing the recorded material that is the same duration as the selected event. The edges of the selected event serve as the punch-in and -out points that are used for recording. Recording into an event allows you to establish a pre-roll before recording, which gives you time to prepare before recording starts.

Because the entire recording is saved to the media file (not just the material between the edges of the take), you are not limited to the recorded material contained in the length of the new take. You can adjust the edges of the event or slip the contents of the event if necessary. *For more information, see Shifting the contents of (slipping) an event on page 85.*

The existing event that you record into is not affected or deleted. Instead, the event now contains two media files, each listed as a separate take in the event. *For more information, see Working with multiple recorded takes on page 244.*

1. Place the cursor before the event to allow for pre-roll.
2. Press Ctrl and click the event to select it.

**Tip:** *You can record into multiple events by pressing Ctrl and making selections.*

3. Click the **Arm for Record** button ( ) on the event's track. When recording into multiple selected events, arm their respective tracks at this time.
4. Click the **Record** button ( ) on the transport bar to begin recording.
5. Click the **Record** button ( ) again or the **Stop** button ( ) on the transport bar to stop recording.

### Recording into an event with a time selection

Recording into a time selection allows for a pre- and post- roll during recording. The time selection is adjustable to increase or decrease the pre- and post-roll duration. During recording, the selected event's edges serve as the punch-in and -out points. You can create multiple punch-in and -out points by selecting more events within the time selection.

You may need to split an existing event into three pieces so that you can select a smaller portion of the event to record into. *For more information, see Splitting events on page 83.*

1. Click the **Arm for Record** button ( ) on the desired track(s).
2. Select the event to record into.

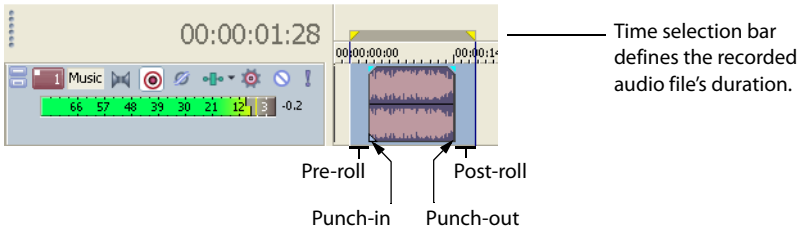
> **Tip:** *You can record into multiple events by pressing Ctrl and making your selections.*

3. On the marker bar, drag a time selection. You can adjust the time selection by dragging the selection bar's starting and ending points. Make the time selection start before the event for a pre-roll.
4. Click the **Record** button ( ) on the transport bar to begin recording.

   If input monitoring is turned on, the track's original audio is played until the cursor reaches the selected event. When the cursor plays through the selected event, you'll hear your recording input, and the track's original audio is played again when the cursor moves past the selected event.

#### Using pre-roll

The previous technique allows you to define the playback region with a time selection and sets the punch-in and punch-out points in the recording to the event boundaries. When you click the **Record** button, playback begins at the beginning of the time selection. The event is then filled with the newly recorded material. The audio file that is recorded to your hard disk is the full duration of the time selection. The event only contains a portion of the full recorded performance and can therefore be trimmed (both shorter and longer) and repositioned within the event.




### Triggering from MIDI timecode

Recording can be triggered and synchronized by an external MIDI device that outputs (generates) MIDI timecode (MTC). When triggering from MIDI timecode, you should have your audio devices connected together via a master digital word clock. The word clock keeps the audio hardware locked together, eliminating the need for the software to constantly vary its playback rate to stay synchronized. The incoming timecode is only used for an absolute time reference. *For more information, see Sync tab on page 429.*

1. From the **Options** menu, choose **Preferences** and go to the **Sync** tab.
2. From the **Trigger from MIDI Timecode settings** drop-down list, select the device that you want to trigger Vegas Pro software.
3. Click **OK**. The Preferences dialog closes.
4. Click the **Arm for Record** button ( ) on the desired tracks.
5. Right-click the time display and choose **MIDI Timecode In**. The time display now shows the timecode being generated from your MIDI device. The top of the display reads **MTC Input Waiting**.

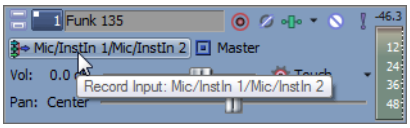
6. Begin generating MTC from your MIDI device. The top of the time display now reads **MTC Input Locked**, the time updates from the MIDI device, and recording automatically begins. Typically, there is a short delay between when you begin generating MTC and synchronization.

### Recording using an input bus

When you use an input bus to record audio, you can include input bus effects with the recorded signal.

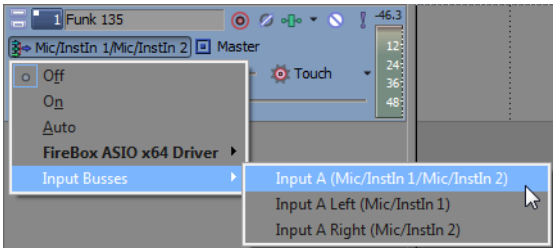
For example, imagine that you need to record an electric guitar with an amplifier-modeling plug-in.

Scenario 1: Plug your guitar into your sound card's instrument input and choose that input as your recording input.



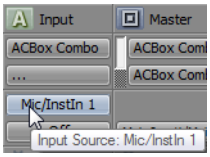

In this scenario, you could then add your amplifier-modeling plug-in as a track effect and record with input monitoring on. Your guitar would be recorded directly (without the plug-in), and the plug-in would be processed each time you play or render your project. This method allows you to adjust the plug-in settings as you work on your project.

Scenario 2: Set up an input bus that uses your amplifier-modeling plug-in as an insert effect, and choose that input bus as your recording input.




In this scenario, your amplifier-modeling plug-in is cooked into the recorded signal. This method allows you to record your processed signal but doesn't allow you to change your amplifier settings without rerecording the guitar part.

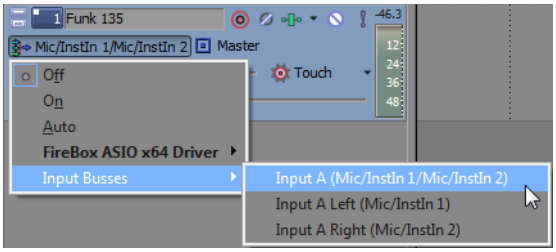
1. Add an input bus to your project. *For more information, see Adding track, assignable FX, and bus channels on page 199.*
2. Set up your input bus:
   a. Click the **Add New Insert FX** button ( ... ) in the Insert FX control region of the input bus channel strip to add plug-ins to your input bus.
   b. In the I/O control region of the input bus channel strip, click the **Input Source** button and choose the sound card input you want to record.




   c. Click the **Output** button in the I/O control region of the input bus channel strip and choose **Off**. The bus output is left off so we can monitor the input through the track.

3. Set your track to record from your input bus:

   a. Click the **Record Input** button, choose **Input Busses** from the menu, and choose your input bus.



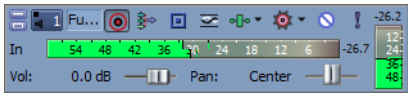

   b. Click the **Record Input** button and choose **Input Monitor Mode: On** or **Input Monitor Mode: Auto** so you can hear your input signal during recording.

   - When **Auto** ( ) is selected, you will hear the input monitor signal when playback is stopped and during recording. If you're recording into selected events, you'll hear the input monitor signal only when the cursor passes over the selected events.
   - When **On** ( ) is selected, the behavior is similar to Auto mode, but you will always hear the input monitor during recording. Monitoring is not toggled on and off when recording into a selected event.

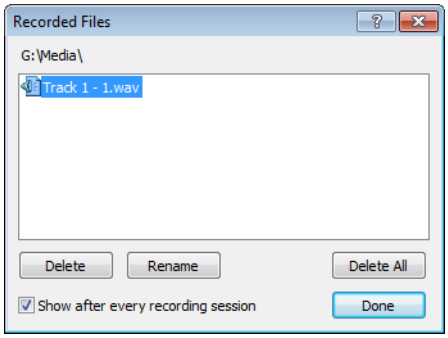
**Important:** *Your ability to monitor effects in real time is dependent on your computer's performance. Effect automation envelopes are bypassed during record monitoring.*

4. Position the cursor where you want to start recording.
5. Select the **Arm for Record** button ( ) on the track where you want to record. Arming a track enables it for recording.

   When a track is armed, the track meter displays the track's level. If input monitoring is not on, the meter displays the level of your input source. If input monitoring is turned on, the meter shows the level of the input source plus the track effects chain.




6. Click the **Record** button ( ) on the Transport bar to start recording.
7. To stop recording, click the Record button again or click the **Stop** button ( ) on the Transport bar. The Recorded Files dialog is displayed.
8. Use the Recorded Files dialog to confirm the file name and location of your recorded audio. Click **Delete** or **Delete All** if you do not want to save the recorded files, or click **Rename** to change the file's name.




9. Click **Done** to close the Recorded Files dialog. Your recorded file is displayed as a new event in the timeline.

## Working with multiple recorded takes

Clicking the **Loop Playback** button ( ) on the transport bar enables you to continually create takes during recording. Takes are different versions of a recorded event that you can quickly switch between to choose the best one. Each take within an event references a different source media file.

During recording with loop playback enabled, the time selection continually repeats and starts recording a new take until you stop recording. You can preview, select, rename, and delete takes. *For more information, see Working with takes on page 105.*

## Specifying where recordings are stored

When you record, the event appears on the timeline while its media source file is written to your hard drive. The first time you arm a track to record in a project, you are prompted to identify the location where the recordings will be stored.

### Changing where recorded files are stored when arming a track

1. Press Shift and click the **Arm for Record** button ( ) on a track. The Project Recorded Files Folder dialog appears.
2. Browse for the location where you want to save recorded files.
3. Click **OK**.

### Changing where recorded files are stored when starting to record

1. Press Shift and click the **Record** button ( ) on the transport bar. The Project Recorded Files Folder dialog appears.

> **Tip:** *You can also press Ctrl+Shift+R to specify the location for recorded files when starting to record.*

2. Browse for the location where you want to save recorded files.
3. Click **OK**.

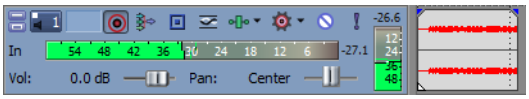
### Changing where recorded files are stored in the Project Properties dialog

1. From the **File** menu, choose **Properties**. The Project Properties dialog appears.
2. Click the **Audio** tab to display the project's audio properties.
3. Click **Browse**. The Recorded Files Folder dialog appears.
4. Browse for the location where you want to save recorded files.
5. Click **OK**.

> **Tip:** *You can select* **Start all new projects with these settings** *in the Project Properties dialog to store recorded media source files to the same location in every new project.*

## Monitoring audio levels

While you're recording, a responsive meter is provided in the track header to monitor the incoming signal level of the selected recording device. It is important that you record with the highest signal possible without clipping.




A reading of 0 dB is the maximum for a digital signal. Clipping occurs when the incoming signal is too high to be represented as a digital value. The result is distortion in the recording. A clipped signal will be indicated by a red clip warning at the top of the meters.

Right-click the meters and choose a command from the shortcut menu to adjust the display of the meters.

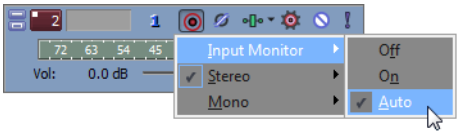
## Using record input monitoring

If you're using an ASIO audio device and you want to hear your recording signal with real-time track effects, you can turn on input monitoring.

To turn on input monitoring, click the **Record Device Selector** button ( or ) and choose **Input Monitor** from the menu, and then choose **Auto** or **On** from the submenu. During recording, your signal will be played back with the current track effects chain, but a dry (unprocessed) signal is recorded.

When **Auto** is selected, you will hear the input monitor signal when playback is stopped and during recording. If you're recording into selected events, you'll hear the input monitor signal only when the cursor passes over the selected events.

When **On** is selected, the behavior is similar to **Auto** mode, but you will always hear the input monitor during recording—monitoring is not toggled on and off when recording in to a selected event.




**Note:** *Your ability to monitor effects in real time is dependent on your computer's performance. Effect automation envelopes are bypassed during record monitoring.*

Chapter 14

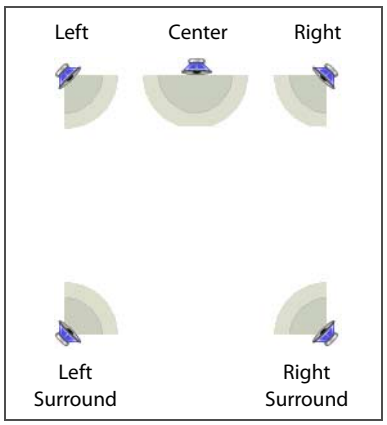
# Working with 5.1 Surround

Vegas® Pro software allows you to create 5.1-channel mixes to prepare audio for DVD-Video or 5.1-channel music projects.

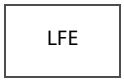
## What is 5.1 surround?

5.1 surround is a standard format consisting of three speakers across the front and two speakers in the rear. The ".1" is a sixth channel called low-frequency effects (LFE) that enhances the bass levels in the mix.

5.1 surround includes five main channels...




...and a sixth channel for low-frequency effects.




The LFE channel is commonly used in motion pictures to enhance low audio frequencies for effects such as explosions or crashes. Audio in this channel is commonly limited to a range from about 25 Hz to 120 Hz. Unlike the five primary channels, the LFE channel adds no directional information. Depending on the speaker setup and audio levels, the sound assigned to the LFE channel may be routed among the five main speakers or to an additional subwoofer.

## Setting up surround hardware

Before you create surround projects, you should set up your system to provide 5.1 surround playback. To play a 5.1 surround project, you must have an appropriate speaker setup such as:

- Six powered speakers
- Six passive speakers with a six-channel amplifier

Your system must also have an appropriate sound card setup such as:

- 5.1-compatible sound card
- Sound card with three stereo outputs
- Three stereo sound cards

There are several ways to set up your system, depending on the sound card and speaker setup you are using.

| | Six powered speakers | Six passive speakers with a six-channel amplifier |
|---|---|---|
| 5.1-compatible sound card | Connect powered speakers to your sound card's outputs as indicated by your sound card's documentation. | Connect your sound card's front, rear, and center/subwoofer outputs to the appropriate inputs on a six-channel amplifier/home theater receiver. Connect front, rear, center, and LFE speakers to the amplifier. |
| Sound card with three stereo outputs | Connect powered speakers to your sound card's outputs where you have routed each of the pairs of channels. The left channel of the Center/LFE pair is the center channel; the right channel is the LFE channel. | Connect your sound card's outputs to the appropriate inputs on a six-channel amplifier/home theater receiver. Connect front, rear, center, and LFE speakers to the amplifier. |
| Three stereo sound cards | Connect powered speakers to your sound cards' outputs where you have routed each of the pairs of channels. The left channel of the Center/LFE pair is the center channel; the right channel is the LFE channel. | Connect your sound card's outputs to the appropriate inputs on a six-channel amplifier/home theater receiver. Connect front, rear, center, and LFE speakers to the amplifier. |

## Setting up surround projects

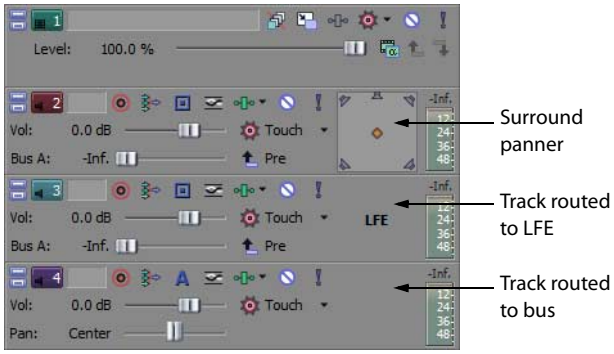
You can configure a Vegas Pro project to use 5.1 surround in the Project Properties dialog. You can also choose to apply a low-pass filter for the LFE channel. Applying a low-pass filter approximates the bass-management system in a 5.1 decoder and ensures that you're sending only low-frequency audio to the LFE channel.

1. From the **File** menu, choose **Properties**.
2. Click the **Audio** tab.
3. From the **Master bus mode** drop-down list, choose **5.1 surround**.
4. To limit the audio sent to the LFE channel, do the following:
   - Select the **Enable low-pass filter on LFE** check box and enter a value in the **Cutoff frequency for low-pass filter** box. The low-pass filter isolates the audio sent to the LFE channel by limiting it to frequencies lower than the value entered in the **Cutoff frequency for low-pass filter** box.
   - Choose a setting from the **Low-pass filter quality** drop-down list to determine the sharpness of the filter's rolloff curve. **Best** produces the sharpest curve.

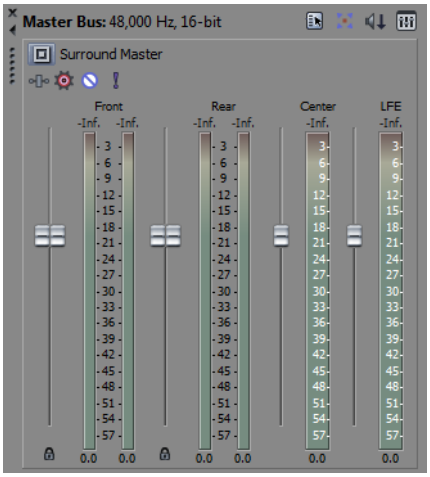
**Note:** *Before rendering your surround project, check your surround authoring application's documentation to determine its required audio format. Some encoders require a specific cutoff frequency and rolloff, while other encoders require that no filter be applied before encoding.*

5. Click **OK**.

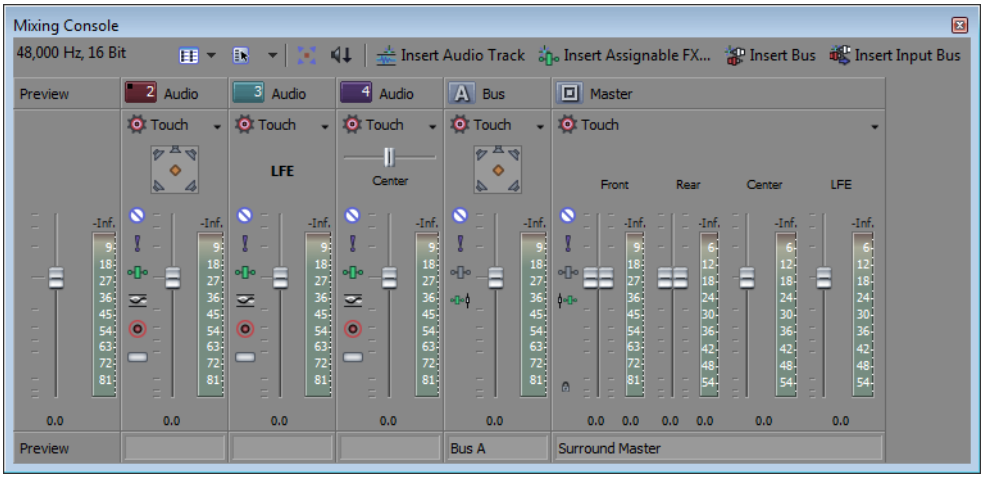
   The track list, Master Bus window, and Mixing Console switch to 5.1 surround mode.




Track list in 5.1 surround mode




Master Bus in 5.1 surround mode




Mixing Console in 5.1 surround mode

## Routing the master bus outputs

When you're working in 5.1 surround mode, you'll need to indicate where to send the output from your 5.1-channel mix.

### Setting your default routing

Use the Audio Device tab of the Preferences dialog to set default routing for 5.1 surround projects.

1. From the **Options** menu, choose **Preferences**.
2. Click the **Audio Device** tab.
3. From the **Audio device type** drop-down list, choose an audio device type other than **Microsoft Sound Mapper** (such as **Windows Classic Wave Driver**).
4. Choose the playback devices for the six surround channels:
   - From the **Default Stereo and Front playback device** drop-down list, choose the appropriate device for the front left and right surround channels.
   - From the **Default Rear playback device** drop-down list, choose the appropriate device for the rear left and right surround channels.
   - From the **Default Center and LFE playback device** drop-down list, choose the appropriate device for the center and LFE surround channels.
5. Click **OK**.

### Overriding the default device routing

By setting up the device routing in the **Audio** tab of the Preferences dialog, you have set the defaults for surround routing. However, you can override the default device routing at any time using the Surround Master bus.

1. In the Master Bus window, click the **Audio Device Selector** button ( ) on the Surround Master bus. A menu of surround channels (**Front L/R**, **Rear L/R**, and **Center/LFE**) appears.
2. In the submenu, match a surround pair with the appropriate output.
3. Repeat steps one and two to match each surround pair to the appropriate output.

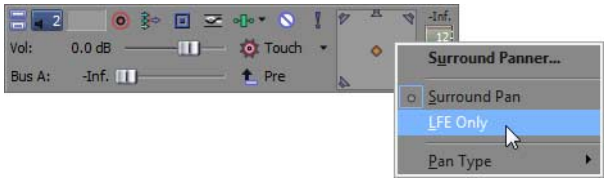
## Assigning audio to the LFE channel

Once the project is in 5.1 surround mode, you must decide whether a track will provide the "5" (surround panning) or the "1" (LFE channel) in 5.1 surround. Initially, all tracks in a surround project are set to provide surround panning, but you can assign a track to the LFE channel instead.

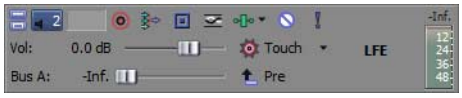
You can assign an individual track to the LFE channel or you can route the track to a mixer control (bus or assignable effect chain) and assign the mixer control to the LFE channel.

To assign audio to the LFE channel, right-click the surround panner on the track header or channel strip and choose **LFE Only** from the shortcut menu. The track or channel strip is assigned to the LFE channel.

Right-click the surround panner and choose **LFE Only**...




...to assign the track or mixer control to the LFE channel.




To change a track or channel strip back to surround panning, right-click the **LFE** indicator and choose **Surround Pan** from the shortcut menu.

**Note:** *Before rendering your surround project, check your surround authoring application's documentation to determine its required audio format with respect to the LFE channel. For more information, see Setting up surround projects on page 248.*

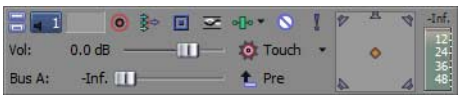
## Adjusting volume

Adjusting track volume for 5.1 surround projects behaves almost identically to stereo projects. The controls in the track headers and Master Bus window can function as trim controls that adjust the overall volume of the track, bus, or assignable effects chain, or they can adjust volume automation settings. *For more information, see Track automation on page 163.*

### Adjusting track volume

You can adjust track volume using the **Vol** fader in the track header the same way you do in stereo projects.

Deselect the **Automation Settings** button ( ) on the track header if you want to adjust trim levels.




Track header in trim mode

Select the **Automation Settings** button if you want to adjust volume automation. The fader handle is displayed as with an automation icon ( ) in automation mode.

Track header in automation mode

### Adjusting assignable effects send or bus send levels

You can adjust send levels for busses or assignable effects chains using the multipurpose fader in the track header. Click the fader label and choose an assignable effects chain or bus from the menu. The fader in the track header can function as a trim control that adjusts the overall send level of the track, or it can adjust send level automation settings.

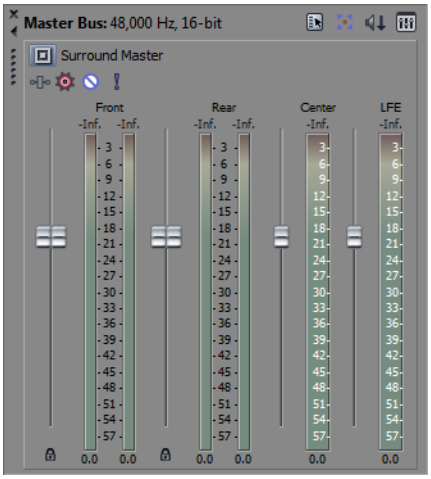
Deselect the **Automation Settings** button ( ) on the track header if you want to adjust trim levels.

Select the **Automation Settings** button if you want to adjust volume automation. The fader handle is displayed with an automation icon ( ) in automation mode.

### Adjusting channel levels

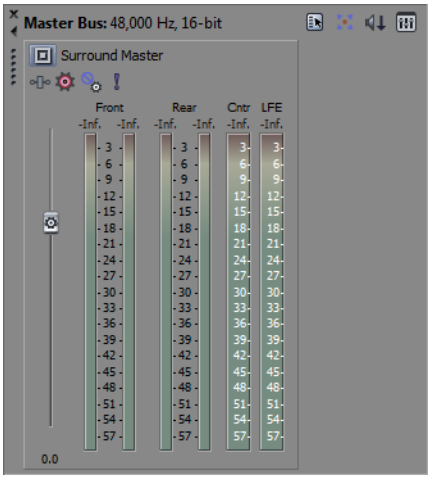
Use the Surround Master bus control in the Master Bus window or Mixing Console to adjust the individual levels of the 5.1 channels. The faders in the track bus control can function as trim controls that adjust the overall level of each channel, or you can automate the master volume of the Surround Master bus (individual channel levels cannot be automated).

Click the **Automation Settings** button ( ) in the bus control or bus track and verify **Show Automation Controls** is not selected if you want to adjust trim levels.




Surround Master controls in trim mode

Select **Show Automation Controls** if you want to adjust volume automation. The fader handle is displayed with an automation icon ( ) in automation mode.




Surround Master controls in automation mode

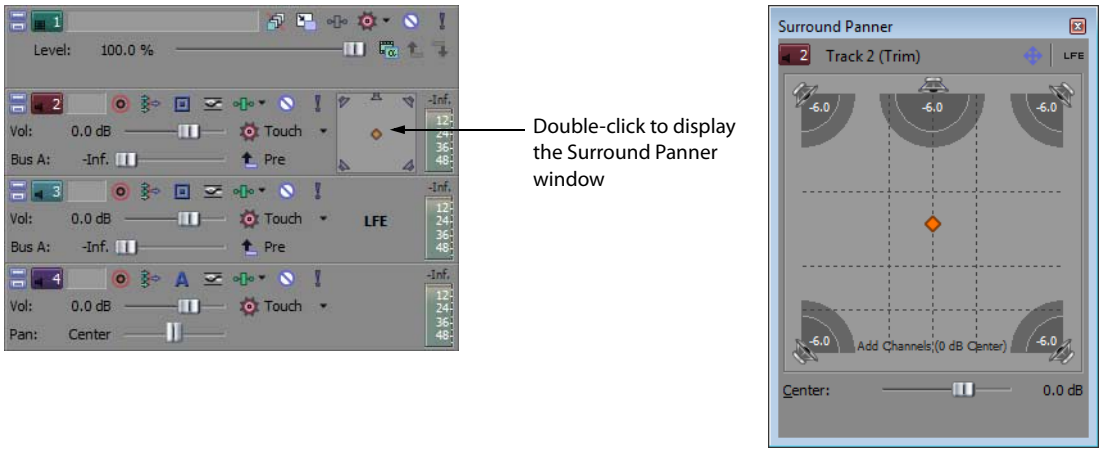
## Panning audio

You can pan audio in a 5.1 surround project in two ways:

- Pan tracks individually using the Surround Panner window.
- Route tracks to channel strips in the Mixing Console (busses and assignable effect chains) and pan the channel strips using the Surround Panner window.

### Panning tracks

1. Deselect the **Automation Settings** button ( ) on the track you want to pan.
2. Double-click the surround panner on the track you wish to pan. The Surround Panner window is displayed.




3. Adjust the panning settings. *For more information, see Using the Surround Panner window on page 253.*
4. Close the Surround Panner window.

> **Tip:** *You can also use the surround panner in the track header to pan your track.*

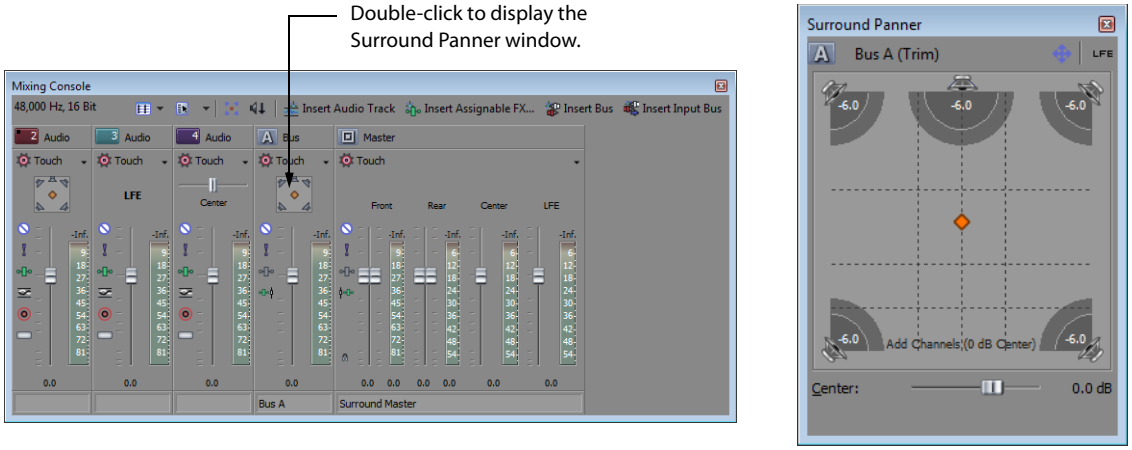
### Panning mixer controls

You can choose to route tracks to busses or assignable effect chains and pan them as a group rather than panning each track individually.

> **Note:** *When you route a track to a bus, stereo (two-channel) output is sent to the mixer control and the mixer control sends 5.1 (six-channel) output to the Surround Master bus.*

1. Add a bus or assignable effect chain to the project. *For more information, see Adding track, assignable FX, and bus channels on page 199.*
2. Route tracks to the bus or assignable effect chain. *For more information, see Assigning audio tracks to busses on page 155 or Assigning audio tracks to assignable effects chains on page 154.*
3. Click the **Automation Settings** button ( ) on the channel strip you want to pan and verify **Show Automation Controls** is not selected.

4. Double-click the surround panner on the channel strip to display the Surround Panner window.




5. Adjust the panning settings. *For more information, see Using the Surround Panner window on page 253.*
6. Close the Surround Panner window.

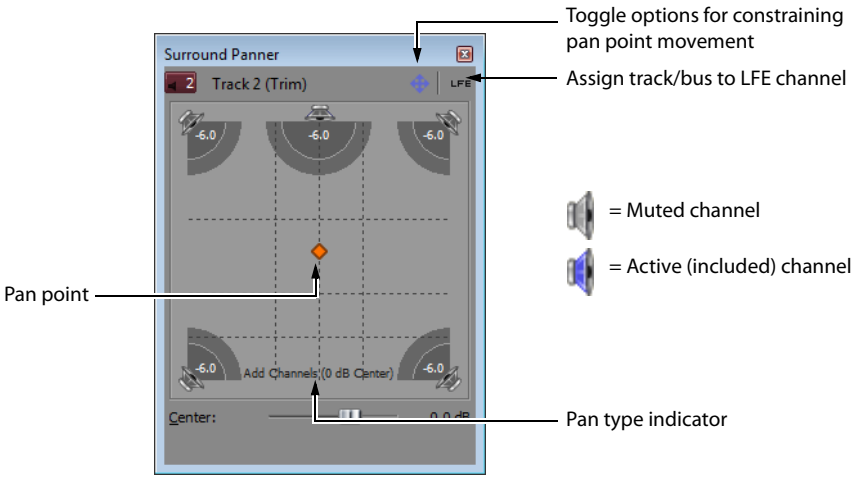
> **Tip:** *You can also use the surround panner on the channel strip to pan your track.*

### Using the Surround Panner window

Whether you're adjusting track panning or channel strip panning, you use the same controls in the Surround Panner window.

View the Surround Panner window by double-clicking a surround panner on a track header or channel strip. Once the Surround Panner window is open, you can dock it in the workspace. *For more information, see Window docking area and floating window docks on page 25.*

> **Tip:** *You can also choose* **Surround Panner** *from the* **View** *menu to display the Surround Panner window. Once the Surround Panner window is displayed, double-click the surround panner for a track or mixer control to view its pan settings.*




1. Click the speaker icons to mute or include channels.

   Muting a channel ensures that no audio bleeds through a channel. For example, you might want to mute all but the center channel when you're panning dialogue to the center channel.

> **Tip:** *Ctrl+ click a speaker icon to solo the channel.*

2. Drag the pan point to position the sound within the sound field. *For more information, see Moving the pan point on page 254.*
3. Click the center speaker icon to include the center channel and drag the **Center** fader to apply a gain to the center channel.

   Applying a gain to the center channel may make dialogue more present in the mix.

**Note:** *When automating panning using keyframes, you cannot automate the gain applied using the* **Center** *fader. For more information, see Automating panning on page 256.*

### Moving the pan point

A variety of methods are provided to help you position the pan point in the Surround Panner window.

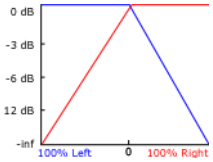
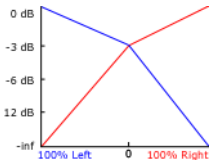
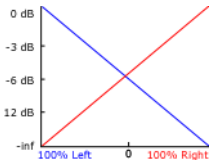
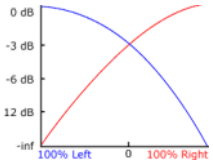
| Method | Description |
|---|---|
| | Click to toggle through three options for constraining pan point motion as you drag: Move Freely (), Move Left/Right Only (), and Move Front/Back Only (). |
| Double-click | Double-clicking the pan point resets it to the center front of the surround panner.<br>Double-clicking in the Surround Panner window moves the pan point to the double-click location. |
| Ctrl+drag | Makes fine adjustments. |
| Shift+drag | Constrains motion to a line through the center of the surround panner. |
| Alt+drag | Constrains motion to a constant radius from the center of the surround panner. |
| Shift+Alt+drag | Constrains motion to the maximally inscribed circle (a constant radius at the greatest possible distance from the center of the surround panner). |
| Arrow keys | Moves front/back/left/right. |
| Ctrl+Arrow keys | Makes fine adjustments. |
| Page Up/Page Down | Moves front/back. |
| Shift+Page Up/Page Down | Moves left/right. |
| Numeric keypad 1-9 | Jumps to a corner, edge, or center of the surround panner. |
| Ctrl+Numeric keypad 1, 3, 7, 9 | Jumps to a location on the maximally inscribed circle (a constant radius at the greatest possible distance from the center of the surround panner). |
| Mouse wheel | Moves front/back. |
| Shift+mouse wheel | Moves left/right. |
| Ctrl+mouse wheel | Makes fine front/back adjustments. |
| Ctrl+Shift+mouse wheel | Makes fine left/right adjustments. |

### Choosing pan types

When you pan a track or channel strip, you can choose among several pan types to determine how to pan the audio. The current pan type appears at the bottom of the Surround Panner window.

Right-click the Surround Panner window and choose a pan type from the shortcut menu:

| Item | Description |
|---|---|
| **Add Channels** | This mode is most useful for panning stereo files. As you pan across the stereo field, the stereo image appears to move across the speakers. As you pan toward either side, the signal from the opposite channel is added to the channel you are panning toward until at the extreme both channels are sent to a single channel at full volume.<br>This mode uses a linear panning curve.<br>**Important:** *You can introduce clipping when channels are added. Monitor the meters in the Master Bus window and adjust the track volume accordingly.* |

| Item | Description |
|---|---|
| **Balance (0 dB Center)**<br>**Balance (-3 dB Center)**<br>**Balance (-6 dB Center)** | In a stereo project, this mode can help you adjust the relative signal levels of the channels in stereo source material. As you pan from the center to either side, the opposite channel begins at the specified center value (0 dB -3 dB, or -6 dB), and decays to -infinity. The signal in the side you are panning toward progresses from the specified center value (0 dB, -3 dB, or -6 dB) to 0 dB.<br>This panning mode uses a linear panning curve.<br>For example, when you pan fully right, the right channel is played at 0 dB and the left channel is not audible. As you pan to the center, each channel is attenuated to the specified center value (0 dB -3 dB, or -6 dB). As you pan to the left, the left channel is played at 0 dB, and the right channel is not audible.<br>  <br><br>With the **Balance (0 dB center)** setting, no gain or cut is applied when you're panned to the center, which can make the center seem louder.<br>  <br><br>With the **Balance (-3 dB center)** setting, a -3 dB cut is applied when you're panned to the center.<br>  <br><br>With the **Balance (-6 dB center)** setting, a -6 dB cut is applied when you're panned to the center.<br>Panning in a 5.1 surround project follows the same rules: as you pan from the center to any channel in a 5.1 surround project, the signal in the channel you are panning toward progresses from the specified center value to 0 dB. The signal in the channel you are panning away from begins at the specified center value and decays to -infinity. |
| **Constant Power** | This mode is most useful for panning monaural source material. In this mode, sound will maintain its volume when you pan across channels.<br>If you pan a stereo file 100% R, only the right channel of your media file is played, and this channel is sent to both output channels. If you continue to pan to the left, the left channel is gradually added to the output, and the right channel is gradually faded out until only the left channel will be heard through both output channels when the slider is at 100% L.<br>  <br><br>If you pan a file fully right midway between the front and rear channels in a 5.1 surround project, only the right channel of your media file is played, and this channel is sent to the right-front and -rear output channels. If you pan to the left, the left channel is gradually added to the output, and the right channel is gradually faded out until only the left channel is sent to the left-front and -rear output channels. |

| Item | Description |
|---|---|
| **Film** | This mode allows you to pan between pairs of adjacent speakers in 5.1 surround projects using a constant power model. This mode is optimized for theater-style speaker placement. In stereo projects, Film mode functions identically to Constant Power.<br>As you drag the pan point to the center speaker, the sound becomes diffused through the front and rear speakers. When the track is panned fully to the center speaker, there is no output from the front and rear speakers.<br>Dragging the pan point to the center of the surround panner sends the signal to all speakers.<br>**Note:** *If you're panning fully to a single speaker, you might notice that some signal is mixed to the opposite speaker. This is because the ideal placement for surround speakers does not match the representation in the surround panner. For example, panning to the front-left speaker produces a low-level signal in the rear-left speaker.*<br>*This is because your front-left speaker should be positioned 30° left of center and the speaker in the surround panner is located 45° left of center. To produce a true 45° left-of-center pan, the signal is panned between the front- and rear-left speaker.* |

### Using the grid to monitor panning

The grid in the Surround Panner window helps you to visualize how your panning will sound. The grid's spacing changes to match the current pan type.

The vertical lines represent the points where the left-to-right signal ratio is 6 dB, 0 dB, and -6 dB respectively: at the far-left line, the left channel is 6.0 dB louder than the right channel.

The horizontal lines represent the points where the front-to-rear signal ratio is 6 dB, 0 dB, and -6 dB respectively. As you adjust the **Center** fader, the lines move forward or backward to compensate for the center-channel gain.

**Note:** *The grid assumes that you're using a correctly set-up surround system (matched speakers and ideal positioning). Variations in your monitoring system will cause inconsistencies between the graph and perceived output.*

## Automating panning

You can automate panning by adding keyframes. Keyframes are similar to envelope points in that they specify a settings state at a point in time. However, unlike envelope points, keyframes appear just below the track to which they apply.

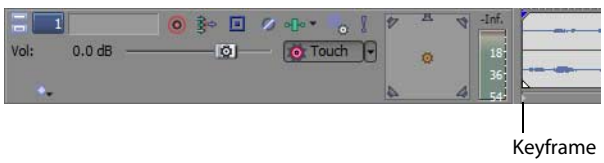
To add panning keyframes to a mixer control, you must first view the mixer control in timeline. From the **View** menu, choose **Show Bus Tracks** to view the bus track at the bottom of the timeline. *For more information, see Using audio bus tracks on page 159.*

### Turning on panning keyframes

Before adding individual keyframes, you must first turn on the panning keyframes for the track or bus track.

1. Select the track or bus track for which you want to automate panning.
2. From the **Insert** menu, choose **Audio Envelopes**, and choose **Surround Pan Keyframes** from the submenu.

   An additional row appears below the track with a single keyframe positioned at the beginning of the project. This single keyframe represents the current panning settings for the track.



### Adding panning keyframes

With panning keyframes turned on, you can add keyframes at any location along the track or bus track.

1. Position the cursor where you want to begin panning the track.
2. Select the **Automation Settings** button ( ) on the track you want to pan.
3. Double-click the surround panner to display the Surround Panner window.
4. Adjust the panning settings. *For more information, see Using the Surround Panner window on page 253.*

> **Note:** *You cannot automate muting/including channels.*

5. Close the Surround Panner window.

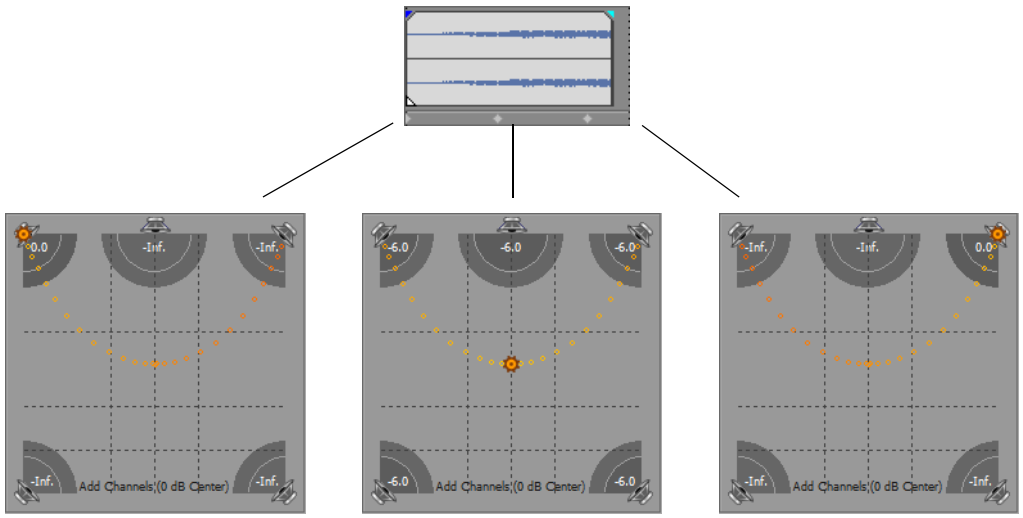
   A keyframe with the pan settings you created appears below the track at the cursor position.

New keyframe

> **Tip:** *You can also add keyframes by double-clicking the keyframe row or by right-clicking the row and choosing* **Add Point** *from the shortcut menu. Once you've added the keyframe, double-click it to adjust panning settings in the Surround Panner window.*

As you add keyframes to a track or bus track, the Surround Panner window shows the path of the panning keyframes. The **Smoothness** slider controls the smoothness of the interpolation path between the keyframes. *For more information, see Adjusting the Smoothness slider on page 258.*

> **Note:** *The* **Smoothness** *slider is displayed at the bottom of the Surround Panner only when you have inserted two or more keyframes on the track.*




The Surround Panner window shows the path of the panning keyframes.

### Working with keyframes

After you add keyframes, you can work with them in much the same way as envelope points. *For more information, see Composite level automation (video only) on page 169.*

#### Moving keyframes

Drag a keyframe to a new position below its track.

#### Duplicating keyframes

Hold Ctrl and drag a keyframe to a new position below its track.

#### Editing keyframes

1. Double-click a keyframe to open the Surround Panner window.
2. Adjust the panning settings as desired and close the window.

#### Changing keyframe interpolation curves

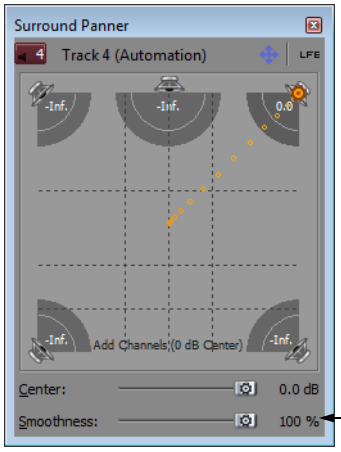
To control how the pan is interpolated between keyframes, right-click a keyframe and choose an interpolation curve type from the shortcut menu. Keyframe interpolation curves control how the pan occurs over time. The keyframe color changes according to the interpolation curve you have chosen.

| Keyframe | Interpolation curve | Description |
|---|---|---|
| | Hold | No interpolation takes place. The keyframe's settings are maintained until the next keyframe. |
| | Linear | Panning is interpolated in a linear path. |
| | Fast | Panning is interpolated in a fast logarithmic path. |
| | Slow | Panning is interpolated in a slow logarithmic path. |
| | Smooth | Panning is interpolated along a smooth, natural curve. |

#### Adjusting the Smoothness slider

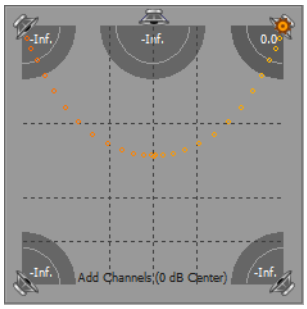
If you have two or more keyframes, the **Smoothness** slider at the bottom of the Surround Panner controls the perceived motion of sound within the sound field among three or more keyframes. When you drag the **Smoothness** slider to 0, Vegas Pro software interpolates the changes between keyframes along a linear path. As you increase the smoothness value, the path between keyframes grows more curved and smooth.

1. Double-click a keyframe. The Surround Panner window appears.

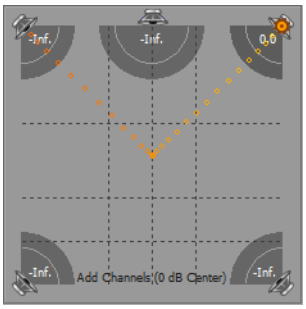


2. Drag the **Smoothness** slider to adjust the smoothness of the spatial interpolation path leading up to this keyframe.

Three keyframes with smoothness=100...




...and the same three keyframes with smoothness=0.




#### Locking keyframes to events

If you want keyframes to move with an event when it is moved along the timeline, choose **Lock Envelopes to Events** from the **Options** menu.

#### Hiding keyframes

1. Select the track for which you want to hide keyframes.
2. From the **View** menu, choose **Show Audio Envelopes**, and choose **Surround Pan Keyframes** from the submenu.

#### Deleting keyframes

Right-click a keyframe and choose **Delete** from the shortcut menu.

## Rendering surround projects

Rendering a surround project creates six monaural files (AIFF, ATRAC, WAV/W64, or PCA) or a single 5.1-channel file (AC-3, WAV/W64, WMA, and WMV) that your authoring application can use to create DVD-Video or 5.1-channel music projects.

**Note:** *Before rendering your surround project, check your surround authoring application's documentation to determine its required audio format. Some encoders require a specific low-pass filter cutoff frequency and rolloff, and your encoder may require that no filter be applied before encoding. Use the* **Audio** *tab of the Project Properties dialog to configure a low-pass filter. For more information, see* *Setting up surround projects on page 248*.

1. From the **File** menu, choose **Render As**. The Render As window is displayed.
2. In the Output File box, choose the folder and file name you want to use to save your file.

3. In the Output Format box, choose the multiple mono template, or choose an appropriate 5.1-channel template if the selected file type supports it.

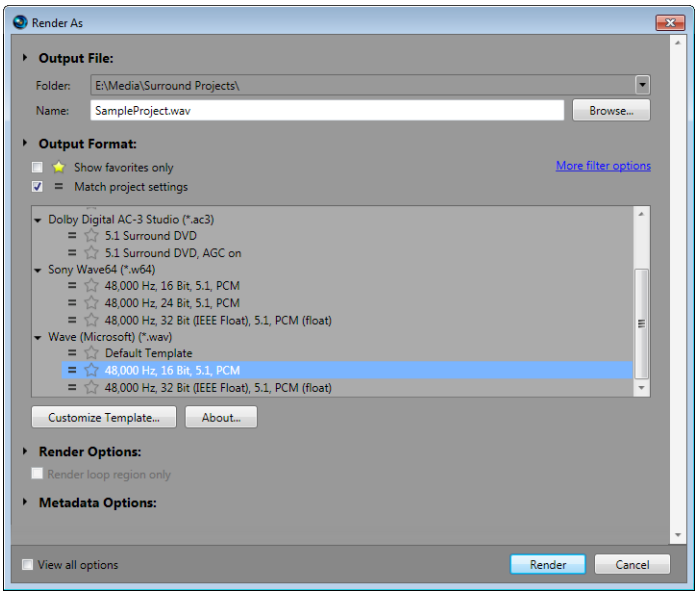
### Tips:

- *When you render a 5.1 surround project to AIFF (.aif), Perfect Clarity Audio (.pca), Wave64 (.w64), or Wave (.wav) formats, you can save each of the surround master busses to a separate file by choosing the multiple mono setting from the* **Template** *drop-down list. For example, if you'd typed My Film.wav in the* **File name** *box, the following files would be rendered: My Film Right.wav, My Film Right Surround.wav, My Film LFE.wav, My Film Left.wav, My Film Left Surround.wav, and My Film Center.wav.*
- *When you render a 5.1 surround project to WAV or WAV64 format using the* **48,000 Hz, 16 Bit, 5.1, PCM** *or* **48,000 Hz, 32 Bit, 5.1, PCM** *template, you can create a single 5.1 channel file. The rendered file contains channel-mapping information so that Vegas Pro will preserve surround panning information when adding these files to 5.1 surround projects.*

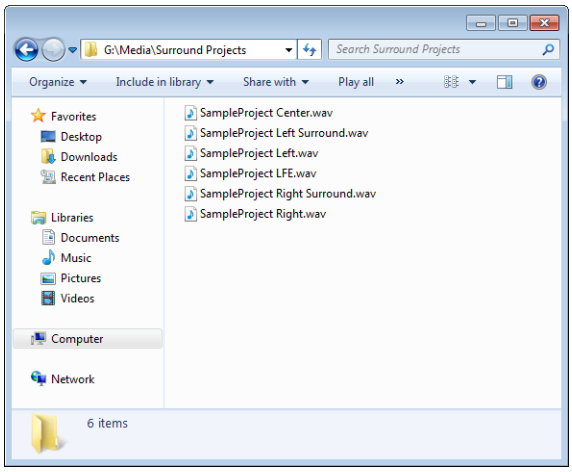
  *Legacy Sony applications (and third-party applications) may not be able to read these 5.1-channel files. In this case, you can render a single six-channel file by selecting the* **Enable multichannel mapping** *check box and creating a channel mapping using the Surround Master outputs.*
- *For more information about rendering multichannel audio and setting up multichannel mapping, see* *Rendering multichannel audio files on page 366*

4. Select the **Render loop region only** check box if you want to save only the portion of the project that is contained within the loop region. **Loop Playback** does not need to be selected on the workspace for this option to work.
5. If the selected file type supports it, you can select the **Save project markers with media file** check box to include markers, regions, and command markers in the rendered media file. If the information cannot save in your media file, it will create an .sfl file (using the same base name as your media file).
6. Click **Render**. A dialog is displayed to show rendering progress.
7. When rendering is complete, click the **Open** button to play the file with its associated player, or click **Open Folder** to open the folder where you saved the file.

Rendering the surround project SampleProject.wav...




...results in six .wav files.



## Creating a DVD or Blu-ray Disc with DVD Architect Pro software

If you have DVD Architect™ Pro software, you can create menu-based projects, music compilations, picture slide shows, or a single-movie DVD that will play back automatically in your DVD or Blu-ray Disc™ player.

DVD Architect Pro software includes support for many file types and can convert your media to the formats required as needed. However, for best performance (decreased disc preparation time and recompression), render your files in the appropriate format using Vegas Pro.

*For more information, see Rendering projects for use in DVD Architect Pro on page 370 and Rendering projects for Blu-ray Disc on page 371.*

Chapter 15

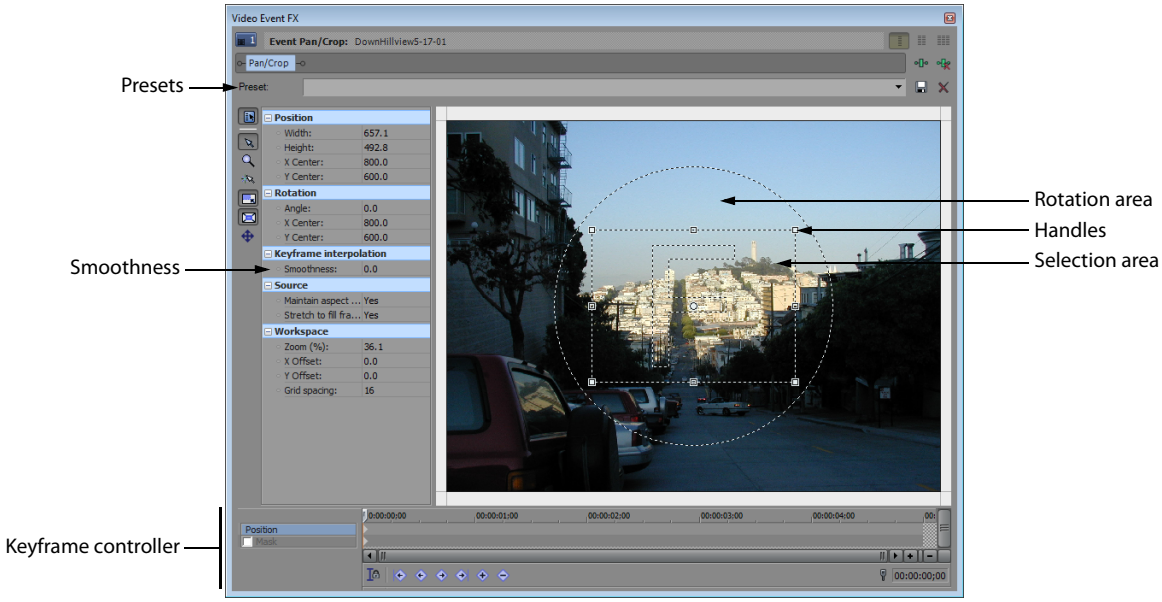
# Using Advanced Video Features

While simple to learn, Vegas® Pro software is a powerful application with many advanced features. This chapter covers some of the advanced video features of this powerful tool.

## Panning and cropping video events

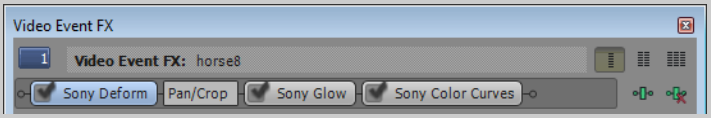
From the **Tools** menu, choose **Video**, and choose **Video Event Pan/Crop** from the submenu to crop, zoom, rotate, or pan the selected video event. You can also use panning and cropping to add motion to video events created with still images.

You can also use the Pan/Crop plug-in to create masks using Bézier curves.




**Note:** *If any controls shown in the figure above are not visible, enlarge the Video FX window by dragging the lower right corner until all controls are revealed.*

**Tip:** *To prevent unwanted blurring, you can choose whether effects are applied to the event before or after any event panning and cropping by arranging the Pan/Crop button in the plug-in chain at the top of the Video Event FX window.*

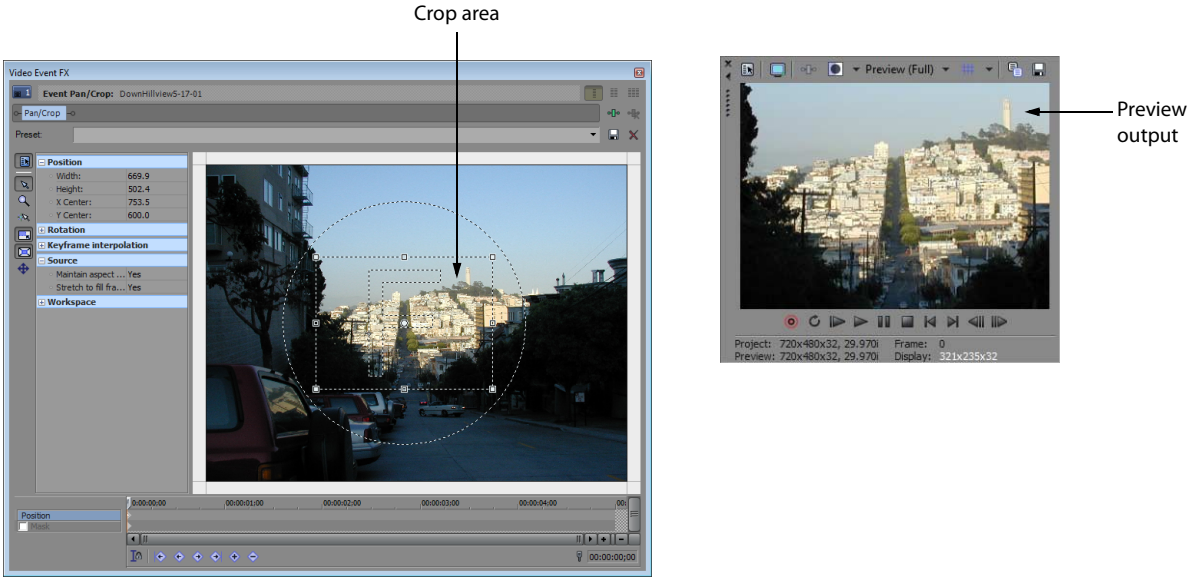



*Here, the Deform plug-in is applied before the pan/crop and the Glow and Color Curves plug-ins are applied after the pan/crop.*

### Cropping or zooming a video event

Cropping is the process of removing the outside edges from an image or video without resizing it.

When you use a single setting for the duration of an event, you are cropping the contents of the event. When you add keyframes to change the extent of cropping through the duration of the event, you can create an animated zoom effect.




1. From the **Tools** menu, choose **Video**, and choose **Video Event Pan/Crop** (or click the **Event Pan/Crop** button ( ) on the video event). The Pan/Crop plug-in is displayed in the Video Event FX window.
2. Adjust the selection area to change the viewable portion of the event.
   - To resize the selection box, drag the handles located around the perimeter of the box. To type specific dimensions for the selection box, expand the **Position** heading on the left side of the window and type new values in the **Width** and **Height** boxes.

     Select the **Lock Aspect Ratio** button ( ) if you want the selection box to retain its aspect ratio during resizing. When the button is not selected, the height and width can be resized independently.

     Select the **Size About Center** button ( ) if you want the selection box to retain its center point when you resize the box by dragging its edges. When the button is not selected, the opposite side of the selection box will remain anchored when you drag the edges to resize it.
   - To reposition the selection box, click in the middle of the selection area and drag to a new position. To type a specific location, expand the **Position** heading on the left side of the window and type new values in the **X Center** and **Y Center** boxes.

     When **Move Freely** ( ) is selected, you can move the selection box along the X or Y axis. When **Move in X Only** ( ) is selected, you can only move the selection box horizontally. When **Move in Y Only** ( ) is selected, you can only move the selection box vertically.
   - To zoom in on the selection so the selection fills the output frame, expand the **Source** heading on the left side of the window and choose **Yes** from the **Stretch to fill frame** drop-down list. When **No** is selected, the media retains its original size, and the area outside the selection box is cropped.

**Tip:** *Right-click the workspace to display a shortcut menu that displays commands to restore, center, or flip the selection box. You can also force the box to match the source media's aspect ratio or your project's output aspect ratio. Matching the output aspect ratio can prevent black bars from appearing when you use source media (such as photographs) that does not match your project's aspect ratio.*

The cropping or zooming occurs instantly and the results are updated in the Video Preview window.

3. If you want to create an animated crop or zoom, use the keyframe controller at the bottom of the Video Event FX window to establish distinct zoom settings throughout the duration of the event.

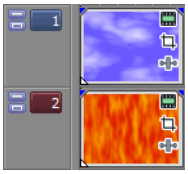
   During playback, intermediate frames are interpolated to create smooth motion. Expand the **Keyframe interpolation** heading on the left side of the window and drag the **Smoothness** slider to adjust the interpolation. *For more information about keyframe animation, see* *Using keyframe animation on page 330*.

> **Tip:** *Use the* **Pan/Crop default smoothness** *control on the External Control & Automation tab of the Preferences window to set the default* **Smoothness** *value for new keyframes. For more information, see* *External Control & Automation tab on page 430*.

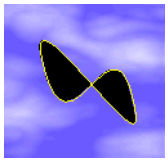
### Creating a Bézier mask

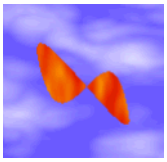
Use the controls in the **Path** heading on the left side of the Pan/Crop plug-in to create masks using Bézier curves. Each event can contain multiple Bézier masks.

For an example of how to use a Bézier mask with the Pixelate plug-in to blur a subject's face, see the Vegas Pro online help.



Video Tracks


Bézier Mask


Video Output

When you use a single setting for the duration of an event, you are masking the contents of the event. You can add keyframes to change the shape, size, or position of the mask to create an animated effect.

1. From the **Tools** menu, choose **Video**, and choose **Video Event Pan/Crop** (or click the **Event Pan/Crop** button ( ) on the video event). The Pan/Crop plug-in is displayed in the Video Event FX window.
2. Select the **Mask** row in the keyframe controller. When the **Mask** row is selected, Bézier curve-drawing tools are displayed so you can create your mask.

   Select the **Mask** check box to apply the mask so you can see the results of your masking in the Video Preview window, or clear the check box to bypass the mask.

3. Select the **Anchor Creation Tool** ( ) on the left side of the Pan/Crop plug-in and click in the workspace to create a mask. See the following table for a description of the tool's behavior.

> **Tip:** *Right-click the curve, choose* **Initialize Tangents**, *and choose a command from the submenu to smooth the path (or portions of the path) to help you get started with your editing.*

**4.** Edit the curves as necessary.

| Button | Tool | Description |
|---|---|---|
| | **Normal Edit** | Use to select and edit control points and tangents.<br>• Click a point to select it, or drag to move the point.<br>• Hold Ctrl while clicking to select/deselect multiple points.<br>• Hold Alt and click a segment to select all points on the path. The pointer is displayed as a ▶.<br>• Hold Alt+Shift while clicking an anchor point to invert the selection state of each anchor on the path. The pointer is displayed as a ▶.<br>• Drag a segment between two anchor points to modify the tangents on each side of the segment. The pointer is displayed as a ▶.<br>• Hold Ctrl while clicking an existing point in a closed path to show or hide the tangents. The pointer is displayed as a ◣.<br>• Drag a tangent control to manipulate the curve. Both sides of the tangent control move about the anchor point. The pointer is displayed as a ▶.<br>• Hold Ctrl while dragging a tangent control to split the halves of the control and adjust them independently or join the two halves of the control if the tangent was previously split. |
| | **Anchor Creation** | Use to create control points.<br>• Click to create an anchor point. Drag before releasing the mouse button to modify the tangents of the new point.<br>• Click the first or last point of an open path to close the path. The tool is displayed as a . Drag before releasing the mouse button to move the entire path.<br>• Click between two anchor points to create a new point. The tool is displayed as a .<br>• If all paths are closed, click to create a new path. |
| | **Anchor Deletion** | Use to remove control points. |
| | **Split Tangents** | Use to adjust control point tangents.<br>• Click a point to display tangent controls, or click the center of a tangent control to reset it.<br>• Drag center of the tangent control to manipulate the curve. Both sides of the tangent control move about the anchor point. The pointer is displayed as a ◣.<br>• Drag the point at either end of the tangent control to manipulate that half of the curve. The pointer is displayed as a ◣.<br>• Hold Shift while dragging a tangent control to split the halves of the control and adjust them independently or join the two halves of the control if the tangent was previously split. |

**5.** Expand the **Path** heading on the left side of the window to set options for your path.

| Item | | Description |
|---|---|---|
| **Mode** | | Choose a setting from the drop-down list to choose the selected path's masking behavior. |
| | **Positive** | The area inside the path is visible in your video output. |
| | **Negative** | The area outside the path is visible in your video output. The area inside the path is transparent. |
| | **Disabled** | The path is bypassed. |
| **Anti alias** | | Choose **Yes** or **No** from the drop-down list to indicate whether you want to apply an anti alias filter to smooth the edges of the path. |
| **Opacity** | | Select the control and type a value in the box (or click the down arrow to display a slider) to set the opacity of the area inside the path. |
| **Feather type** | | Choose a setting from the drop-down list to fade the edges of the path. |
| | **In** | Feathering is applied to the inside edge of the path. |
| | **Out** | Feathering is applied to the outside edge of the path. |
| | **Both** | Feathering is applied to both sides of the path. |
| | **None** | No feathering is applied. |

| Item | Description |
|---|---|
| **Feather %** | Select the control and type a value in the box (or click the down arrow to display a slider) to set the amount of feathering that is applied to the path. |

6. Repeat steps 3 through 5 as necessary if you want to create multiple Bézier masks.
7. If you want to create an animated mask, use the keyframe controller at the bottom of the Video Event FX window to establish distinct mask settings throughout the duration of the event.

   During playback, intermediate frames are interpolated to create smooth motion. *For more information about keyframe animation, see* *Using keyframe animation on page 330*.

### Rotating a video event

1. From the **Tools** menu, choose **Video**, and choose **Video Event Pan/Crop** (or click the **Event Pan/Crop** button ( ) on the video event). The Pan/Crop plug-in is displayed in the Video Event FX window.
2. Adjust the selection area to crop the event. (If you rotate the entire frame, the background behind the video event will show through.)
3. Drag the corner of the selection box to rotate the event. Your cursor is displayed as a .

   To type a specific rotation angle, expand the **Rotation** heading on the left side of the window and type a new value in the **Angle** box.

4. If you want to rotate your video around a center point other than the center of the selection box, drag the point at the center of the selection point.

   To type a specific center point, expand the **Rotation** heading and type new values in the **X Center** and **Y Center** boxes.

   As you rotate your event, the video will rotate about this center.

   The rotation occurs instantly and the results are updated in the Video Preview window.
5. If you want to use multiple rotation settings, use the keyframe controller at the bottom of the Video Event FX window to establish distinct settings throughout the duration of the event.

   During playback, intermediate frames are interpolated to create smooth motion. Expand the **Keyframe interpolation** heading on the left side of the window and drag the **Smoothness** slider to adjust the interpolation. *For more information about keyframe animation, see* *Using keyframe animation on page 330*.

**Tip:** *Use the* **Pan/Crop default smoothness** *control on the External Control & Automation tab of the Preferences window to set the default* **Smoothness** *value for new keyframes. For more information, see* *External Control & Automation tab on page 430*.

### Panning a video event

You can use event panning to focus on the action of a video event, or you can simulate motion using a still image.

**Tip:** *Another use for panning is Pan-and-Scan, which is a technique commonly used when film is converted for television. Movie screens and film are usually wider (~2.35:1) than television (~1.33:1). When you transfer the film to video, you can use panning to crop your video frame and move the crop area to follow the action or subject. For more information, see* *Using pan-and-scan on page 337*.

1. From the **Tools** menu, choose **Video**, and choose **Video Event Pan/Crop** (or click the **Event Pan/Crop** button ( ) on the video event). The Pan/Crop plug-in is displayed in the Video Event FX window.
2. Adjust the selection area to crop the event. (If you pan the entire frame, the background behind the video event will show through.)
   - To resize the selection box, drag the handles located around the perimeter of the box. To type specific dimensions for the selection box, expand the **Position** heading on the left side of the window and type new values in the **Width** and **Height** boxes.

     Select the **Lock Aspect Ratio** button ( ) if you want the selection box to retain its aspect ratio during resizing. When the button is not selected, the height and width can be resized independently.

     Select the **Size About Center** button ( ) if you want the selection box to retain its center point when you resize the box by dragging its edges. When the button is not selected, the opposite side of the selection box will remain anchored when you drag the edges to resize it.
   - To reposition the selection box, click in the middle of the selection area and drag to a new position. To type a specific location, expand the **Position** heading on the left side of the window and type new values in the **X Center** and **Y Center** boxes.

     When **Move Freely** ( ) is selected, you can move the selection box along the X or Y axis. When **Move in X Only** ( ) is selected, you can only move the selection box horizontally. When **Move in Y Only** ( ) is selected, you can only move the selection box vertically.
   - To zoom in on the selection so the selection fills the output frame, expand the **Source** heading on the left side of the window and choose **Yes** from the **Stretch to fill frame** drop-down list. When **No** is selected, the media retains its original size, and the area outside the selection box is cropped.

**Tip:** *Right-click the workspace to display a shortcut menu that displays commands to restore, center, or flip the selection box. You can also force the box to match the source media's aspect ratio or your project's output aspect ratio. Matching the output aspect ratio can prevent black bars from appearing when you use source media (such as photographs) that does not match your project's aspect ratio.*

3. Expand the **Source** heading on the left side of the window and choose **Yes** from the **Stretch to fill frame** drop-down list.
4. Drag the selection box to set the viewable portion the event. Your cursor is displayed as a ✣.
5. Use the keyframe controller at the bottom of the Video Event FX window to establish distinct settings throughout the duration of the event. The path of the panning is drawn in the Video Event FX window.

   During playback, intermediate frames are interpolated to create smooth motion. Expand the **Keyframe interpolation** heading on the left side of the window and drag the **Smoothness** slider to adjust the interpolation. *For more information about keyframe animation, see* *Using keyframe animation on page 330*.

**Tip:** *Use the* **Pan/Crop default smoothness** *control on the External Control & Automation tab of the Preferences window to set the default* **Smoothness** *value for new keyframes. For more information, see* *External Control & Automation tab on page 430*.

### Editing keyframe interpolation

If you have two or more keyframes, you can expand the **Keyframe interpolation** heading and edit the **Smoothness** setting to adjust the smoothness of the motion.

Smoothness adjusts spatial interpolation: how motion occurs within the frame. A **Smoothness** setting of 0 produces linear motion from one keyframe to the next. Increasing the setting produces a curved path.

**Note:** *If you want to adjust temporal interpolation how motion occurs over time change a keyframe type by right-clicking a keyframe and choosing a new interpolation curve type (linear, fast, slow, smooth, sharp, or hold).*

During playback, intermediate frames are interpolated to create smooth motion. *For more information about keyframe animation, see Using keyframe animation on page 330.*

**Tip:** *Use the* **Pan/Crop default smoothness** *control on the External Control & Automation tab of the Preferences window to set the default* **Smoothness** *value for new keyframes. For more information, see External Control & Automation tab on page 430.*

### Editing source media aspect ratio and stretching

Use the controls in the **Source** heading on the left side of the Pan/Crop plug-in to indicate how your video will be stretched or cropped.

| Item | Description |
|---|---|
| **Maintain aspect ratio** | Choose **Yes** from the drop-down list (or select the **Lock Aspect Ratio** button ( )) to prevent distortion of the source media file.<br>When you choose **No**, the source media's ratio of height to width is not preserved when video is stretched in the output frame. |
| **Stretch to fill frame** | Choose **Yes** from the drop-down list if you want the media in the selection box to fill the output frame.<br>When you choose **No**, the media retains its original size, and the area outside the selection box is cropped. |

### Editing workspace display settings

Use the controls in the Workspace heading on the left side of the Pan/Crop plug-in to change the display.

| Item | Description |
|---|---|
| **Zoom** | To change the magnification of the video in the workspace, select the **Zoom** box and type a new setting, or select the box and click the down arrow to display a slider that you can use to adjust the magnification level. |
| **X offset** | To pan the display left or right, select the **X offset** box and type a new setting, or select the box and click the down arrow to display a slider that you can use to adjust the offset.<br>Negative values move the video to the left, positive values move to the right, and 0 represents the horizontal center of the workspace. |
| **Y offset** | To pan the display up or down, select the **Y offset** box and type a new setting, or select the box and click the down arrow button to display a slider that you can use to adjust the offset.<br>Negative values move the video up, positive values move the video down, and 0 represents the vertical center of the workspace. |
| **Grid spacing** | Select the **Grid spacing** box and type a new setting or select the box and click the button to display a slider that you can use to adjust the number of divisions displayed in the workspace. |

**Tip:** *You can also change the* **X offset** *and* **Y offset** *values by hovering over the workspace until the pointer is displayed as a hand icon ( ) and dragging the workspace to pan in any direction.*

### Editing the selection box

Use the controls in the Edit heading on the left side of the Pan/Crop plug-in to edit the selection box in the window.

| Item | Description |
|---|---|
| **Snap to grid** | Choose **Yes** from the drop-down list if you want to snap the edges of the selection box to the workspace grid when you drag to resize or move the box.<br>When you choose **No**, you can move and resize the selection box freely. |

| Item | Description | |
|---|---|---|
| **Lock aspect** | Choose **Yes** from the drop-down list if you want the selection box to retain its aspect ratio during resizing.<br>When you choose **No**, the height and width can be resized independently. | |
| **Scale about center** | Choose **Yes** from the drop-down list if you want the selection box to retain its center point when you resize the box by dragging its edges.<br>When you choose **No**, the opposite side of the selection box will remain anchored when you drag the edges to resize it. | |
| **Allow movement** | **Horizontal** | You can move the selection box only horizontally in the workspace. |
| | **Vertical** | You can move the selection box only vertically in the workspace. |
| | **Unconstrained** | You can move the selection box horizontally or vertically in the workspace. |

You can also right-click in the Pan/Crop plug-in to display a shortcut menu that will allow you to quickly adjust the selection box:

| Item | Description |
|---|---|
| **Restore** | Returns the crop area to full frame. |
| **Center** | Moves the crop area to the center of the frame. |
| **Flip Horizontal** | Flips the event left to right and backwards. |
| **Flip Vertical** | Flips the event top to bottom and backwards. |
| **Match Output Aspect** | Sets the x,y ratio to match your project properties. |
| **Match Source Aspect** | Sets the x,y value to match the properties of your source media. |

## Saving or recalling a keyframe preset

Keyframe presets save the settings of the selected keyframe row at the cursor position.

**Note:** *Presets for the Position and Mask keyframe rows are saved separately. Presets you create in the Position row will not be available in the Mask row.*

### Saving a preset

1. Adjust your Position or Mask settings as desired to create a keyframe.
2. Type a name in the **Preset** box.
3. Click the **Save Preset** button ( ).

### Recalling a preset

1. Click in the Position or Mask keyframe row to select a row and position the cursor where you want to apply the preset.
2. Choose a setting from the **Preset** drop-down list.

   If no keyframe exists at the cursor position, one is created using the settings from the preset. If a keyframe exists at the cursor position, the keyframe's settings are replaced with the settings from the preset.

### Deleting a preset

Click the **Delete Preset** button ( ) to delete the current preset.

## Working with still images

You can use still images for a number of purposes including slide shows, overlay graphics, and titles. You can insert still images into projects just like any other media files. The default length for a still image event when it is first added to a track is five seconds (this is an adjustable preference), but this duration can be modified by dragging the edges to create a still image event of any length. Images cannot be looped, but share many characteristics with video files, including transparency. In addition, you can use many of the same tools on image events that you can on video events, such as track motion, panning and cropping, and video effects plug-ins.

### Creating still images for use in Vegas Pro software

Many image formats can be imported, including BMP, GIF, JPG, PNG, TIFF (requires QuickTime™), PSD (flattened), and TGA. If you have the option to create PNG files in your graphics software, this is the recommended file type. PNG files use lossless compression and can also include alpha channel information, which is one of the cleanest methods of creating transparency for overlays. an alpha channel can automatically be detected, if present, in PNG files.

> **Note:** *The alpha channel may not be automatically detected in TGA images. Right-click a TGA image in the Project Media window or an event on the timeline and choose* **Properties**. *Then, in the Media Properties dialog, select the type of alpha channel from the list. For more information, see* *Editing properties for a video file on page 285*.

If you know your media file has an alpha channel and it is not detected properly, right-click the media file in the Project Media window or an event on the timeline and choose **Properties** from the shortcut menu. Then, in the **Media** tab, select the appropriate alpha channel type from the **Alpha channel** drop-down list. **Premultiplied** is the recommended setting. You can save this setting so that the alpha channel is properly detected on other media files with the same properties. *For more information, see* *Setting custom stream properties on page 287*.

#### Correcting images for DV pixel aspect ratios

For best results when importing still images, create images that account for the pixel aspect ratio of your desired output format. Vegas Pro software does a good job stretching images to fit the output format, but some distortion occurs if the pixel aspect ratio for the source format does not match the destination format.

To calculate pixel aspect ratio correction, use this formula:

*Output frame pixel width* **X** *Output format pixel aspect ratio = Still image pixel width*

For example, this is the formula for NTSC DV format:

720 (DV screen frame pixel width) **X** .9091 (DV pixel aspect ratio)= 655 (pixel width)

Use these figures as a guide when creating images:

- Full frame, pixel-aspect-corrected still images for use in NTSC DV projects are 655x480.
- Full frame, pixel-aspect-corrected still images for use in PAL DV projects are 787x576.

#### Automatically cropping still images added to the timeline

Vegas Pro software can automatically crop still images you add to the timeline to match the project frame size.

Automatic crop setting turned off

Portrait still image with pillarboxing

Automatic crop setting turned on

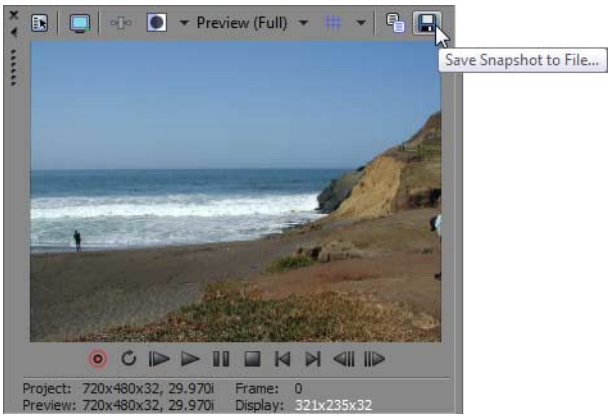
Portrait still image cropped to fill frame

To enable this feature, select the **Automatically crop still images added to the timeline** check box on the **Editing** tab in the Preferences dialog. *For more information, see Editing tab on page 427.*

You can use the Pan/Crop plug-in to adjust the cropping after you have added a still image to the timeline and the software has automatically cropped the image. *For more information, see Cropping or zooming a video event on page 264.*

### Capturing a timeline snapshot

You can create still images of a single frame of your project. Once saved, the snapshot can be used just like any other still image.




1. Position the cursor on the frame of the project you wish to capture as a still image.

> **Tip:** *You can change the size of the image by using the* **Preview Quality** *button. Choose* **Auto** *or* **Full** *to capture the frame at its full resolution, or choose* **Half** *or* **Quarter** *to capture a smaller image.*

2. Click the **Save Snapshot to File** button ( ) on the Video Preview window. The Save Snapshot to File dialog appears.
3. Select a file format and type a name for the new still image file.
4. Click **Save**. The image is added to the Project Media window.

### Creating a slide show

A slide show composed of still images and an accompanying soundtrack can be an excellent way to show off your pictures. You can insert multiple images to instantly create a slide show, complete with crossfades.

Importing high-resolution still images and using panning, cropping, and track motion tools can add interest to an otherwise static slide show. *For more information, see Cropping or zooming a video event on page 264 and Adding track motion on page 339.*

1. In the **Options** menu, verify that **Automatic Crossfades** is selected.
2. From the **Options** menu, choose **Preferences**. Adjust the following settings on the **Editing** tab:
   - Enter the length for the still images in the **New still image length** box.
   - Select **Automatically overlap multiple selected media when added**.
   - Enter the length of the automatic overlap in the **Amount** box in the **Cut-to-overlap conversion** section of the dialog.
3. Click **OK**. The Preferences dialog closes.
4. Select all of the images you want to use in the Explorer.
5. Right-click and drag these files to the timeline.
6. From the shortcut menu, choose **Add Across Time**.

If you want, you can replace the crossfades between images by dragging transitions to the crossfade regions at a later time. *For more information, see Using transition effects on page 324.*

> **Note:** *When using photographs or other media that is not the same frame aspect as your video, you'll see black bars on the sides or above and below the image. To create a crop rectangle that matches the project frame aspect, right-click the image and choose* **Match Output Aspect** *from the shortcut menu.*

## Adding titles, text, and credits

Most video projects include titles and credits. There are several ways to add text to your project: you can use the included plug-ins for static text and scrolling credits, or you can use an external image-editing program to create images with text on them.

### Adding titles and text with the Titles & Text plug-in

1. From the **View** menu, choose **Media Generators** to display the Media Generators window.
2. In the left pane, select the Titles & Text plug-in. The available presets are displayed in the right pane.
3. Drag a preset to a position on the timeline to create a generated media event.

> **Tip:** *If you want text to appear as an overlay, add it to a track above the video you want to overlay and use a transparent background. For more information about compositing video tracks, see* *Compositing on page 306*.

4. Use the Titles & Text plug-in controls to edit the appearance of your text. *For more information about the Titles & Text plug-in, see the Vegas Pro online help.*

### Adding titles and text with the ProType Titler

With the ProType Titler, you can create static text, animated text effects with splined paths, per-character animation, and advanced curves. Add shadows, glows, blurs, and gradients for unique text treatments.

1. From the **View** menu, choose **Media Generators** to display the Media Generators window.
2. In the left pane, select the ProType Titler plug-in. The available presets are displayed in the right pane.
3. Drag a preset to a position on the timeline to create a generated media event.

> **Tip:** *If you want text to appear as an overlay, add it to a track above the video you want to overlay and use a transparent background. For more information about compositing video tracks, see* *Compositing on page 306*.

4. Use the ProType Titler plug-in controls to edit the appearance of your text.

   You can use animation in the ProType Titler to create scrolling and crawling credits.

   *For more information about the ProType Titler plug-in, see the Vegas Pro online help.*

### Inserting text with the Text plug-in

1. From the **View** menu, choose **Media Generators** to display the Media Generators window.
2. In the left pane, select the Text plug-in. The available presets are displayed in the right pane.
3. Drag a preset to a position on the timeline to create a generated media event.

> **Tip:** *If you want text to appear as an overlay, add it to a track above the video you want to overlay and use a transparent background. For more information about compositing video tracks, see* *Compositing on page 306*.

4. Use the Text plug-in controls to edit the appearance of your text. *For more information about the Text plug-in, see the Vegas Pro online help.*

### Creating a title from a graphic

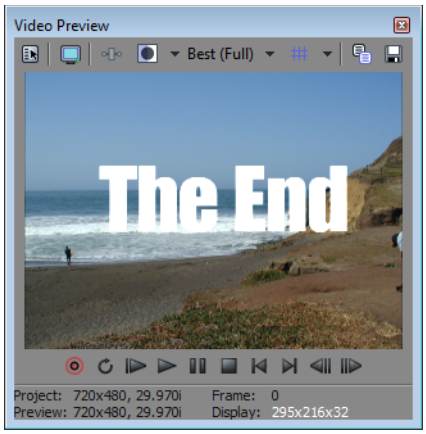
Title images can be created in almost any editing program. The following general procedure explains how to create titles with a transparent background.

> **Tip:** *You can use track motion to animate titles created from still images. For more information, see* *Adding track motion on page 339*.

1. Start your image-editing application.
2. Create a new image and set the dimensions of the new image to be the same as the frame size for the project. *For more information, see Correcting images for DV pixel aspect ratios on page 271.*
3. Make the default canvas (background) transparent.
4. Select the Text tool and type the text for your title.

**Note:** *Size and position your titles carefully to fit within the Title Safe Area, or the titles may extend beyond the edges of your television. For more information, see Identifying safe areas on page 350.*

5. Save the file as a PNG, PSD, or TGA file (PNG is recommended). Make sure that you save the alpha channel information, which will be used for transparency.
6. Add the image as an event to the track above the track containing the background.
7. Click the **Compositing Mode** button ( ) to set the title track to **Source Alpha (default)**.




**Notes:**

- *If your title is saved as a TGA image, the alpha channel may not be detected automatically. Use the Media Properties dialog and choose a new setting from the* **Alpha channel** *drop-down list. For more information, see Editing properties for a video file on page 285.*
- *If your image does not have an alpha channel, you can apply the Chroma Keyer filter to the image to key out the background. For more information, see Chroma keying on page 320.*

## Resampling video

Resampling allows Vegas Pro software to interpolate frames in an event when the frame rate of a media file is lower than the project's frame rate. With resampling, the intervening frames are interpolated from the source frames, much like a crossfade between the original frames.

You can instruct Vegas Pro software to resample the video of a single video event or to resample the entire project at the time of final rendering:

- To resample an event, right-click a video event and choose **Properties** from the shortcut menu. In the **Video Event** tab of the Properties dialog, choose the **Smart resample**, **Force resample**, or **Disable resample** radio button. *For more information, see* *Resample (video only) on page 181*.
- To resample the project, choose **Render As** from the **File** menu. In the Render As dialog, click the **Custom** button to access custom rendering settings. Select the **Resample the frame rate of all video** check box. *For more information, see* *Custom rendering templates on page 374*.

The original media file looks something like this over three frames.

To convert these three frames into nine frames for a faster frame rate, Vegas Pro software must generate the intervening frames.

Without resampling, the intervening frames are simply the previous frame repeated.

With resampling, the intervening frames are interpolated from the source frames. It is similar to a crossfade effect between the original frames.

Resampling at either the event or project level perform the same function. There are few cases where resampling may be particularly important:

- When the frame rate of the source media for an event is slower than the project's frame rate. For example, when you are using a source media file that has a 10 fps rate in a 29.97 fps rate project, resampling is recommended.
- When changing the speed of a video event. For example, when slowing a clip to 30% using a velocity envelope, resampling is recommended.
- When creating vertically scrolling titles.

When any of the previous situations are true, there are only ten frames of source material for every second of project time. When the project is rendered, there must be roughly thirty frames in each second. The frames must be created between the source media frames, sometimes known as padding. The easiest way to do this is to simply duplicate the previous frame. This can result in less than smooth video playback. Resampling allows Vegas Pro software to interpolate the intervening frames more smoothly.

## Using Edit Decision Lists (EDL)

Vegas Pro Edit Decision Lists (EDL) are text lists of all of the media files used, where they are placed, and how they are trimmed. Vegas Pro EDLs are not the same as those used in traditional linear editing suites and are not intended as a project interchange for other editing applications.

### Creating an EDL

1. From the **File** menu, choose **Save As**. The Save As dialog appears.
2. From the **Save as type** list choose **EDL Text File (.txt)**.
3. Enter a name for the file and browse for a destination.
4. Click **Save**.

You can open EDLs created in another application in order to work with a rough copy of a project. For example, you could create an EDL from a project in a third-party editing application and then import the project into Vegas Pro software via the EDL. For best results, save the EDL file and source media files in a single folder before opening the EDL.

### Opening an EDL

1. From the **File** menu, choose **Open**.
2. Locate the EDL file, select it, and click the **Open** button. If you are working on another project, you are prompted to save your work before a new project is opened.

**Note:** *EDLs do not contain any information about the location of source media. Therefore, the EDL file should be saved in the same directory as the source media. If it is not, or if media is stored in a number of different locations, you are prompted to relink these files when the EDL is imported.*

Because of the significant differences between editing applications, third-party EDL files may not bring all of the project data into Vegas Pro software. Among other differences, events are inserted into the timeline on a single track, all transition effects are replaced with crossfades, and only four audio tracks can be imported.

## Working in DV format

Vegas Pro software is optimized for DV editing. If your project is destined for tape or television, the DV format is an excellent choice. The DV codec installed with Vegas Pro provides video with excellent image quality, even over multiple generations, and provides audio that is better than CD-quality. If you start with well-shot DV footage and stay within the DV format throughout the editing process, you can output broadcast-quality video programs. This section provides guidelines for working in the DV format.

### Selecting source media

Wherever possible, use DV source video clips. You can capture video from DV cameras and decks using an IEEE-1394 card with no quality loss. You can also convert analog footage to DV using a media converter or by passing the video through a DV camcorder.

### Setting project properties

Set your project to match the DV format of your final output. This provides a true WYSIWYG view of the project when you use an external monitor for previewing. This also prevents you from stretching output or changing field order unnecessarily. You can match the project settings to a video source file by using the **Match Media Settings** button ( ) in the Project Properties dialog. *For more information, see Setting video properties based on a media file on page 38 and Modifying project video properties on page 282.*

### Selecting templates

Always select a DV template when performing any of the following tasks in a DV project:

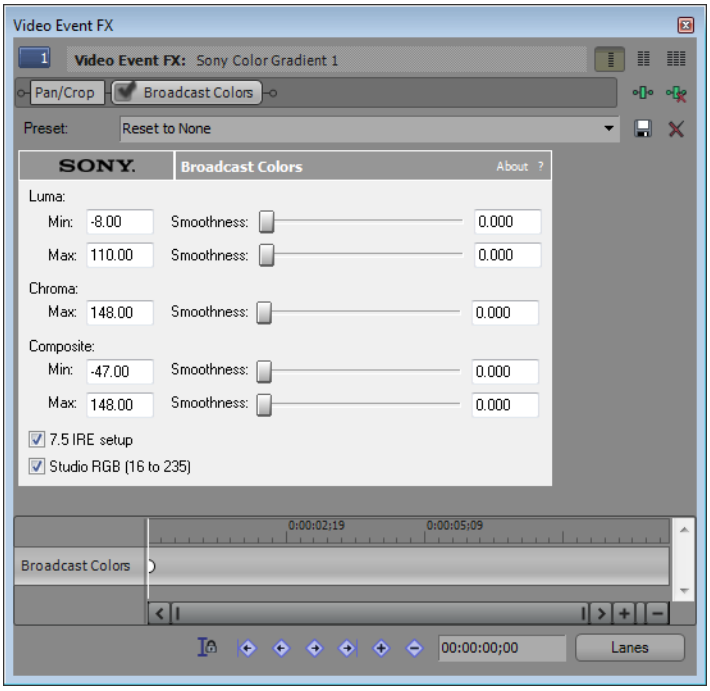
- Prerendering video (*For more information, see Prerendering video on page 347.*)
- Rendering to a new track (*For more information, see Rendering to a new track on page 161.*)
- Printing video to tape from the timeline (*For more information, see Printing video to tape from the timeline on page 378.*)
- Rendering a project (*For more information, see Rendering a project on page 363.*)

When prerendering video or rendering to a new track, a DV template not only optimizes playback performance, but also helps you avoid needless recompression of DV footage. DV material is recompressed only when necessary. Cuts-only DV sequences are not recompressed when you output the project to DV from the timeline or in Video Capture.

The DV templates are designed to provide high quality, pixel aspect-correct, DV-compliant renders when rendering a project or printing to tape from the timeline. Do not select an uncompressed setting when choosing rendering or print-to-tape options. An uncompressed setting produces a large file that will not print back to DV tape from Video Capture or from the timeline.

### Eliminating out-of-range colors

The DV format allows color values to exceed broadcast NTSC and PAL color level standards. If you have a scene whose colors are too hot, or if you want to be sure that your video stays within legal broadcast levels, apply the Broadcast Colors effect to specific events or the entire project.




Be aware that applying the Broadcast Colors effect results in recompression of the video. As a result, render times can increase significantly when the effect is applied to the entire project.

## Working in HDV format

HDV cameras record high-definition video to standard DV tapes using a highly compressed variation of the MPEG-2 format. Because of this compression, you can capture HDV clips at data rates that are no higher than DV capture.

You can use HDV files just like any other supported media type on the timeline.

### Capturing HDV clips

If you have an HDV camera, you can use Vegas Pro software to capture your clips as MPEG-2 transport streams.

> **Tip:** *If you will be delivering your project in standard definition (SD) via DVD or DV tape, you can use the camera's built-in downconversion (if available) to convert your HDV video to the DV format. Use the camera's Options menu to set the camera to output DV, and you can capture and edit video in the same way that you normally use DV in Vegas Pro projects. For more information, see* *Working in DV format on page 277*.

1. Enable the Video Capture application:
   a. From the **Options** menu, choose **Preferences**.
   b. Click the **Video** tab.
   c. Clear the **Use external video capture application** check box.
   d. Click the **OK** button.
2. From the **File** menu, choose **Capture Video** (or click the **Capture Video** button ( ) in the Project Media window) to start the Video Capture application.
3. Configure your HDV device in Video Capture:
   a. Click the **Prefs** button ( ) in the Capture window to open the Capture Preferences dialog.
   b. Click the **Device** tab.
   c. From the **Device** type drop-down list, choose **IEEE 1394/MPEG2-TS Device**.
   d. From the **Device** drop-down list, choose your HDV camera.
4. Capture your clip:
   a. Use the transport controls below the Video Preview window to cue your tape.
   b. Click the **Start Capture** button ( ) to start capturing.
   c. Press the Play button on your camcorder.
   d. Click the **Stop** button ( ) (or press Esc) to end the capture procedure.

   Your clip is saved to the folder specified on the **Disk Management** tab of the Capture Preferences dialog. This path is displayed in the **Capture folder** box in the Video Capture window.

> **Note:** *Select the* **Enable HDV scene detection** *check box on the* **General** *tab of the Capture Preferences dialog if you want to create multiple files if scene changes are detected. When the check box is cleared, HDV clips will be captured to a single file.*

5. You're ready to start editing on the timeline. *For more information, see* *Editing HDV video on the timeline on page 280*.

### Creating proxy files for high-definition editing

If you're working on a system with limited processing power, converting to a lower-resolution format will streamline the editing process and allow you to preview your project.

1. Capture or import your high-definition clips. *For more information, see* *Capturing HDV clips on page 279*.
2. Start a new project.
3. Add your high-definition clips to the timeline.
4. Render your clips to an appropriate proxy format.

You can verify a template's codec by looking at the **Video** format drop-down list on the **Video** tab of the Custom Template dialog.

If you're performing frame rate or frame size conversion, ensure the **Video rendering quality** is set to **Best** on the Project tab of the Custom Template dialog.

| Destination | Proxy Format |
|---|---|
| HDCAM over HD-SDI | Render an .avi file that uses the Sony YUV codec. The frame rate and frame size should match your HDCAM master. |
| Digital Betacam or XDCAM over SD-SDI | Render an .avi file that uses the Sony YUV codec. The frame rate and frame size should match your master. |
| 24p DVD | Render an .avi file that uses one of the following codecs:<br>• Sony YUV (offers the highest quality, but requires a high-performance drive array).<br>• Sony NTSC DV Widescreen (use the **NTSC DV Widescreen 24p (2-3-3-2) pulldown** .avi template). |
| Windows Media HD | Render an MPEG-2 file using one of the following templates. Choose the template that matches your HDV source:<br>• HDV 720-25p.<br>• HDV 720-30p.<br>• HDV 1080-50i.<br>• HDV 1080-60i. |

5. After rendering is complete, you're ready to start editing on the timeline. *For more information, see Editing HDV video on the timeline on page 280.*

**Tips:**

- *If you don't want to convert all clips in their entirety, create regions to indicate the portions of the captured HDV clips that you want to convert to a proxy format, and then render the regions to the desired format.*
- *Remember that Vegas Pro software supports multiple instances. You can use one instance of the application to render your proxy files while you continue editing in another instance.*
- *Using DVD Architect software, you can create a DVD that contains an SD version of your project and place an HD Windows Media version in the Extras folder on the disk. When you browse to the Extras folder via Windows Explorer, you can play the HD version and output it to your computer's display, a home theater, or a projector.*

6. If you're working with proxy files and you plan to render to a format that supports high-definition video, replace the proxy clips with the original high-definition clips before rendering your project or printing to tape.
   a. Right-click the proxy file in the Project Media window.
   b. Choose **Replace** from the shortcut menu.
   c. Browse to the MPEG-2 transport stream that corresponds to the proxy file, and then click **Open**.

   If your destination format is standard definition, you don't need to replace the proxy clips before rendering.

### Editing HDV video on the timeline

You can use native HDV footage (called transport streams) files just like any other supported media type on the timeline.

1. Import the clips from your HDV camera to your local hard drive. *For more information, see Capturing HDV clips on page 279.*
2. Drag your captured clips from the Explorer or Project Media window to the timeline to create events.
3. Edit your project as needed. *For more information, see Editing events on page 76.*
4. Render your project or print to tape. *For more information, see Saving, Rendering, and Printing Projects on page 361.*

## Working with RED ONE and EPIC camera files

RED ONE® and RED EPIC® cameras record 4K footage as REDCODE™ RAW (.r3d) files that you can add directly to the Vegas Pro timeline and edit like any other supported media type.

1. Use the Device Explorer to browse and import clips from your RED camera's memory card or hard drive to your local hard drive. *For more information, see Using the Device Explorer on page 60.*
2. Set your project properties to match the format of your final output.
   - To output a 2K still-image sequence, use the **2K 16:9 24p (2048x1152, 23.976 fps)** template.
   - To output a 4K still-image sequence, use the **4K 16:9 24p (4096x2304, 23.976 fps)** template.
   - To output to Blu-ray Disc™, use the **HD 1080-24p (1920x1080, 23.976 fps)** template.

   *For more information on rendering still-image sequences, see Rendering still-image sequences on page 366. For more information on burning Blu-ray Discs, see Burning a Blu-ray Disc on page 395.*
3. Drag the clips from the Explorer or Project Media window to the timeline to create events.

> **Note:** *RED cameras create new "rollover" files for a clip each time a file reaches 2 GB on disk. For example, a 10-minute clip recorded in 4K will be approximately 20 GB on disk, divided among 10 .r3d files. You can drag any one of these files to the timeline to place the entire clip on the timeline.*

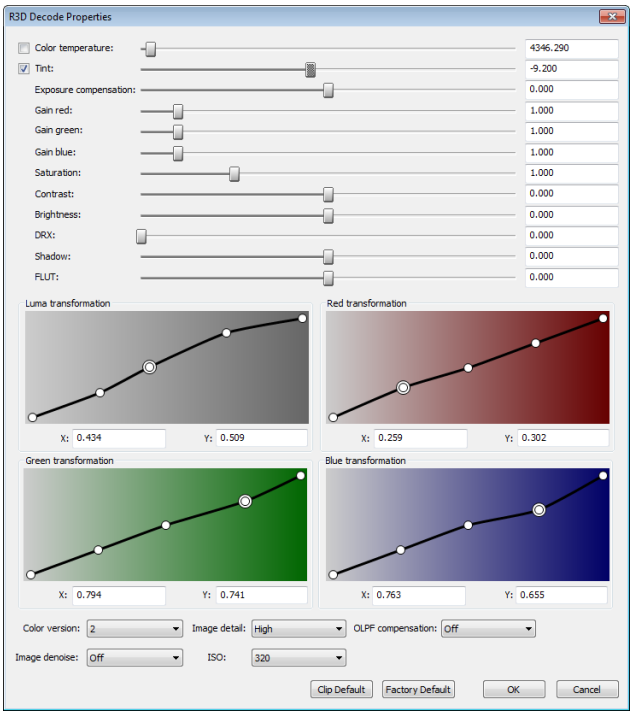
4. Edit your project as needed. *For more information, see Editing events on page 76.*

### Modifying R3D decode properties

You can modify the decode properties of your RED camera files in the R3D Decode Properties window. These settings are applied nondestructively to the raw .r3d file as metadata.

> **Important:** *The decode properties are stored in a .SfDecProp file that is saved using the same base name as the clip. Do not edit the contents of this file.*

To access this window for one or more .r3d files, select the files in the Project Media window, right-click them, and choose **File Format Properties** from the shortcut menu.



### Modifying properties for multiple files

- When multiple files are selected, check boxes appear for slider settings that do not match across all selected files. When you drag the slider or type a new value, the check box is automatically selected, and the new value is applied to all selected files when you click **OK**. Clear the check box to leave the setting unchanged for the selected files.
- If values already match for a slider setting, no check box is displayed, and any changes made to the setting are applied to all selected files.
- If values do not match for a drop-down setting, the setting is blank. If you choose a value for a blank drop-down setting, that value is applied to all selected files.

### Restoring default values

- Double-click a slider ( ) to restore the setting to the clip default.
- Click the **Clip Default** button to restore all settings to the clip default.
- Click the **Factory Default** button to restore all settings to the default settings of the camera.

*For more information about the settings in the R3D Decode Properties window, refer to your RED camera documentation or http://www.red.com/support. These settings map directly to settings on the RED cameras.*

## Modifying project video properties

You can access project video properties by clicking the **File** menu and choosing **Properties** or by clicking the **Project Video Properties** button ( ) on the Video Preview window. Many of these settings are identical to the settings found on the **Project** tab of the Custom Template dialog. Final render properties set up in the Custom Template dialog override the following Project Properties settings. *For more information, see Working with project properties on page 406.*

These properties control all of the default settings for your project. Without making any changes, these are also the settings that are used to create a final rendered movie file.

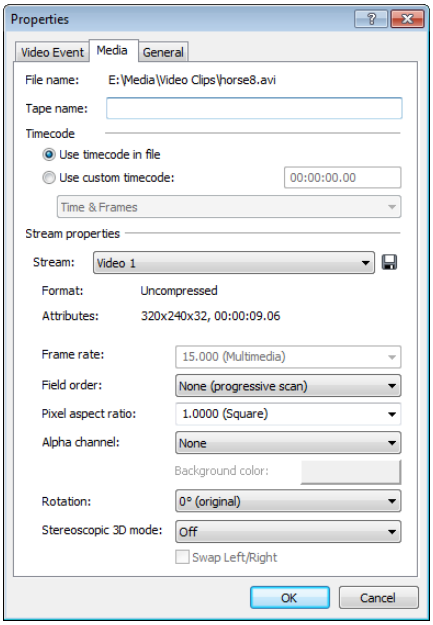
| Item | Description |
|---|---|
| **Template** | Select a preset template from this drop-down list to automatically configure the remaining video controls in this dialog. Many popular formats are included, but you should consult your hardware manuals if you have any questions. You can also save your own custom template. |
| **Match Media Settings** | Click the **Match Media Settings** button ( ) to set your project properties to match the properties of a media file of your choosing. |
| **Width/Height** | Use the values in these boxes to set the frame size of your final movie. The maximum frame size for AVI, MPEG, QuickTime, RealMedia, Windows Media, and still-image output is 2048x2048.<br><br>**Note:** *The maximum frame size is 4096x4096.* |
| **Field order** | Choose an option from this drop-down list to set the field order:<br>• **None (progressive scan)** Select this option for video to be viewed on a computer monitor.<br>• **Upper field first** Select this option for video that will be viewed on a television.<br>• **Lower field first** Select this option for DV output or if **Upper field first** produces jittery or shaky output. |
| **Pixel aspect ratio** | Choose the pixel aspect ratio for the final movie's destination from this drop-down list. *For more information, see Pixel Aspect Ratio on page 468.* |
| **Output rotation** | Choose a setting from the drop-down list to rotate your project's output. Use output rotation to edit projects for display in portrait (rather than landscape) or inverted orientation.<br><br>**Tip:** *If you want to rotate a media file's orientation, you can use the Rotation drop-down list on the Media Properties dialog. For more information, see Editing properties for a video file on page 285.*<br><br>*For more information about working with rotated projects, see Working with rotated projects on page 39.* |

| Item | Description |
|---|---|
| **Frame rate** | Choose a frame rate for the final movie's destination from this drop-down list. *For more information, see Frame Rate (Video) on page 466.* |
| **Stereoscopic 3D mode** | Choose a setting from the drop-down list to create a stereoscopic 3D project, or choose **Off** to create a 2D project.<br>By default, the project's **Stereoscopic 3D mode**, **Swap Left/Right**, and crosstalk cancellation settings will also be used when previewing and rendering your project, but you can override the project settings if necessary.<br>*For more information about setting up a stereoscopic 3D project, see Setting up your stereoscopic 3D project on page 123.* |
| **Pixel format** | Choose a setting from the drop-down list to indicate whether you want to perform video processing (compositing, scaling, previewing, rendering, and most video plug-ins) using 8-bit or 32-bit, floating-point arithmetic.<br>• **8-bit** Performs video processing using 8-bit arithmetic and in the video (studio RGB, or 16-235) color space.<br>• **32-bit floating point (video levels)** Performs video processing using 32-bit arithmetic and in the video color space.<br>• **32-bit floating point (full range)** Performs video processing using 32-bit arithmetic and in the full-range color space.<br>The 32-bit floating point settings allow greater precision for processing video, but require significantly more processing power than working with 8-bit video.<br>**Tips:**<br>• **32-bit floating point (video levels)** *is recommended when working with 10-bit YUV input/output or when using xvYCC/x.v.Color media.*<br>• *When using 8-bit input/output, the* **32-bit floating point (video levels)** *setting can prevent banding from compositing that contains fades, feathered edges, or gradients.*<br>• *Video plug-ins and media generators that do not support floating-point processing are indicated by a blue icon (* *) in the Plug-In Manager and Plug-In Chooser with this icon*  *in the Video FX and Media Generators windows.*<br>• *If you're creating a 32-bit project, you can increase performance during editing and playback by using the* **8-bit** *setting and switching to* **32-bit floating point (video levels)** *before rendering.* |
| **Compositing gamma** | When you choose **32-bit floating point (full range)** from the **Pixel format** drop-down list, you can choose a compositing gamma value:<br>• **1.000 (Linear)** The default setting when you choose **32-bit floating point (full range)** from the **Pixel format** drop-down list.<br>• **2.222 (Video)** Processing in 8-bit video is always performed using a setting of 2.222. Choose this setting when you want to ensure maximum compatibility with projects created in previous version of Vegas Pro software. |
| **Full-resolution rendering quality** | Choose a rendering quality level from this drop-down list. For most projects, **Good** is the recommended setting. If you have critical material where nothing but the highest quality rendering will do, select **Best**. Note that rendering time may increase dramatically as large amounts of extra processing is required for the **Best** setting. |
| **Motion blur type** | Some effects and transitions can involve motion or animation. This list allows you to select whether the frames are blurred slightly to create the illusion of motion on individual frames. This can make computer generated animation appear more smooth and natural. **Gaussian** is the best choice in most situations where blurring is required. |
| **Deinterlace method** | This drop-down list provides several options relating to interlacing. Source video from a television is interlaced. When Vegas Pro software renders effects, it needs to deinterlace the two fields that make up a frame. You can choose the exact method used in this list:<br>• **None** The fields are left interlaced.<br>• **Blend** Contents are used from both fields, which is a good choice for high-detail, low-motion material.<br>• **Interpolate** A single field is used at a time, which is good for low-detail, high-motion material. |

| Item | Description |
|---|---|
| **Adjust source media to better match project or render settings** | Select this check box if you want Vegas Pro to scale images or adjust interlacing to allow media files to work better with your project.<br>This setting will correct for the following types of inconsistencies:<br>• DV media will be cropped for 320x240 Internet renders to prevent letterboxing.<br>• DV widescreen media will be cropped in HD projects.<br>• HD media will be cropped in DV widescreen projects.<br>• 486-line media will be cropped in 480-line projects.<br>• 480-line media will be padded in 486-line projects.<br>When the check box is cleared, source media files are processed with their native settings. |
| **Prerendered files folder** | Displays the path where prerendered files are stored. The Browse button allows you to select a new location to store prerendered files. *For more information, see Prerendering video on page 347.* |
| **Free storage space in selected folder** | Displays the available disk space where prerendered files are stored. |
| **Start all new projects with these settings** | Select this check box to always use these settings for new projects. |

## Modifying media file properties

Vegas Pro software tries to automatically detect the properties of your media files. In most cases, these properties do not need to be modified, but there are times when you may need manual control over some of these attributes, depending on the type of file and your specific hardware configuration.




1. Right-click a file in the Project Media window or an event on the timeline and, from the shortcut menu, choose **Properties**, or select a file in the Project Media window and click the **Properties** button ( ).
2. Modify the parameters on the **Media** tab as needed. *For more information, see Editing properties for an audio file on page 285 and Setting custom stream properties on page 287.*
3. Click **OK**.

### Editing properties for an audio file

The following settings are available for audio files.

**Tip:** *You can also view the properties for the media file associated with an event. Right-click the event, choose* **Properties** *from the shortcut menu, and click the* **Media** *tab.*

| Item | Description |
|---|---|
| **File name** | Displays the current media file name and location. |
| **Tape name** | This can be used to display the name of the tape from which you recorded the audio. The name can be edited here or in the corresponding field in the Edit Details window. |
| **Stream** | If a file contains multiple streams, you can use this control to select the stream for which you want view properties. |
| **Attributes** | Displays the file's sample rate, bit-depth, number of channels, and length. |
| **Format** | Displays the compression format of the file. |

### Editing properties for a video file

The following settings are available for video files:

**Tip:** *You can also view the properties for the media file associated with an event. Right-click the event, choose* **Properties** *from the shortcut menu, and click the* **Media** *tab.*

| Item | Description |
|---|---|
| **File name** | Displays the current media file name and location. |
| **Tape name** | This can be used to display the name of the tape from which you captured the video. The name can be edited here or in the corresponding field in the Edit Details window. |
| **Use timecode in file** | Select this radio button to accept the default timecode settings. |
| **Use custom timecode** | Select this radio button to specify a beginning value for the timecode. |
| **Stream** | If a file contains multiple streams, you can use this control to select the stream for which you want view properties. |
| **Attributes** | Displays the frame size, in pixels (x,y). color depth, and length of the file. |
| **Format** | Displays the compression format of the file. |
| **Field order** | Choose a setting from the drop-down list to change the field order of the file. Consult your capture/video output card's manual for the proper field order.<br>• **None (progressive scan)**: Select this option when viewing the video on a computer. This option ignores interlacing.<br>• **Upper field first**: Select this option (also called odd or field A) for video that will be viewed on a television.<br>• **Lower field first**: Select this option (also called even or field B) for DV output or if **Upper field first** produces jittery or shaky output or if your hardware manual specifies lower field first. |
| **Pixel aspect ratio** | Choose a setting from the drop-down list to change the pixel aspect of the file. This setting will depend on your capture/video output card. Consult your capture/video output card's manual for the proper settings. |

| Item | Description | |
|---|---|---|
| **Alpha channel** | Choose a setting from the drop-down list to change the alpha channel information for the file.<br>If the alpha channel in an image is not detected, choose the correct type of alpha channel from this drop-down list. If you're unsure, try the **Premultiplied** setting first.<br>• **Undefined**: Video provides no alpha channel information. This setting ignores any alpha channel information in the file.<br>• **None**: Video has no alpha channel or there is an alpha channel but it's completely opaque (solid).<br>• **Straight (unmatted)**: Transparency information is maintained in only the alpha channel. Alpha information must be applied to the RGB channels before compositing.<br>• **Premultiplied**: The standard method of handling alpha information. Transparency information is maintained in the alpha and RGB channels, and the image is ready for compositing. No RGB component exceeds the alpha value.<br>• **Premultiplied (dirty)**: Similar to Premultiplied, but RGB components may exceed the alpha. This setting is used mainly for images created by 3D applications involving compositing of 3D images over a non-solid color image background. | |
| **Rotation** | Choose a setting from the drop-down list to rotate a media file's orientation. *For more information, see Working with rotated projects on page 39.* | |
| **Stereoscopic 3D mode** | Choose a setting from the drop-down list to choose the stereoscopic 3D mode for the media file. | |
| | **Off** | Choose this setting for 2D media or to treat a multistream video as 2D. |
| | **Pair with next stream** | Choose this setting for multistream 3D video, such as video from paired files CineForm Neo3D files, or files from a 3D camera. |
| | **Side by side (half)** | Choose this setting when your video contains left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed as half of the available horizontal resolution. |
| | **Side by side (full)** | Choose this setting when your video contains left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed using the full horizontal resolution. |
| | **Top/bottom (half)** | Choose this setting when your video contains left- and right-eye views stacked in a single frame.<br>Left- and right-eye views are displayed as half of the available vertical resolution. |
| | **Top/bottom (full)** | Choose this setting when your video contains left- and right-eye views stacked in a single frame.<br>Left- and right-eye views are displayed using the full vertical resolution. |
| | **Line alternate** | Choose this setting when your video contains interlaced 3D video.<br>Left- and right-eye views are interlaced using half of the available vertical resolution. |
| **Swap Left/Right** | Select this check box if you need to switch the left- and right-eye pictures. This setting is useful if you're using a line-alternate display that displays the right eye on top, if you're using magenta/green anaglyphic glasses, or to create cross-eye free-view 3D. | |

### Setting timecode media properties

These properties appear in the **Timecode** section of the **Media** tab:

- The **Use timecode in file** radio button is the default setting, where the media file's timecode is used.
- The **Use custom timecode** radio button allows you to set the media file's timecode manually.
- If you have selected the **Use Custom timecode** radio button, a drop-down list contains the available timecode formats. **SMPTE Drop (29.97 fps, Video)** for example, is the timecode format for NTSC DV. Changing the timecode format does not change the source media file in any way. It merely changes how the file is measured in time.

### Setting custom stream properties

Media files are opened with a set of default values based on the media file type. When you change any of the values for a media file, these changes are saved for that file in the current project only. If you want to change the default settings for a particular type of video file whenever that type of file is used, click the **Save settings to video profiles for future auto-detection** button () to the right of the **Stream** list. This adds an entry to a file called **vegas video profiles.ini** that can be referenced for future use.

The following properties appear in the Stream properties section of the Media tab:

- If the file has more than one stream of the given type, you can choose the particular stream for which you want to view properties from the **Stream** drop-down list.
- The **Attributes**, **Format**, and **Frame rate** boxes display basic information about the file.
- Choose an option from the **Field order** drop-down list to control how the video field order is handled on a television monitor. Choose **None (Progressive)** for video to be viewed on a computer monitor. For DV output, choose **Lower Field First**. If the output is jittery or shaky, or your hardware's manual specifies it, choose **Upper Field First**.
- While you can choose a different value from the **Pixel aspect ratio** drop-down list, this value should always match the source video's properties.
- The option selected in the **Alpha channel** drop-down list determines how transparency is handled in a file. The default alpha channel setting for most video files is **None**. PNG image files can have an alpha channel that is automatically detected. The options in this drop-down list are described below.

| Alpha channel option | Description |
|---|---|
| **Undefined** | Because the image format provides no alpha channel information, this setting ignores any alpha channel information in the file. |
| **None** | Either there is no alpha channel or there is an alpha channel but it's completely opaque (solid). |
| **Straight (unmatted)** | Transparency information is maintained in only the alpha channel. Alpha information must be applied to the RGB channels before compositing. |
| **Premultiplied** | The standard method of handling alpha information. Transparency information is maintained in the alpha and RGB channels, and the image is ready for compositing. No RGB component exceeds the alpha value. |
| **Premultiplied (dirty)** | Similar to **Premultiplied**, but RGB components may exceed the alpha value. This option is used mainly for images created by 3D applications involving compositing of 3D images over a non-solid color image background. |

Chapter 16

# Closed Captioning

Vegas® Pro software supports adding closed captions to video files and rendering those files as XDCAM HD and XDCAM HD422 MXF files. You can also add captions to video files and render as Windows Media Video for use in Windows Media Player.

## Adding closed captioning to video files

Closed captions help make your video productions accessible to a wider audience. Closed captions are widely used by viewers who are deaf or hard of hearing, those who are learning to read, or who are learning a second language.

Closed captions can be turned on or off by the viewer (unlike open captions, which are always displayed). Closed captions display spoken dialogue and sound effects as on-screen text.

**Notes:**

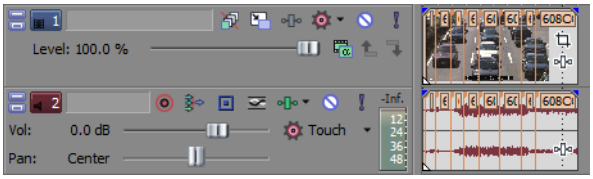
- *Vegas Pro supports CEA608 captions and CEA708 containers containing CEA608 captions. CEA708 captioning is not supported.*
- *When rendering to XDCAM HD/HD422, CEA608 data is uplifted to CEA708 format so that CEA608 and CEA708 captions are available when playing via HD SDI. CEA608 CC1 is uplifted to CEA708 Service 1, and CEA608 CC3 is uplifted to CEA708 Service 2. Please note that caption positions can be slightly different after uplifting to CEA708.*
- *When you render to a format that does not support embedded captioning markers, an .scc file is created using the base name of the rendered media file.*

### Importing or rendering closed captions in an MXF or MPEG-2 file

#### Importing closed captions

Vegas Pro supports closed captioning embedded in XDCAM HD/XDCAM HD422 MXF and MPEG-2 files. ATSC and SCTE formats are supported when reading captions in MPEG-2 files.

When you add media to the timeline or Trimmer, embedded captioning markers are displayed as media markers.



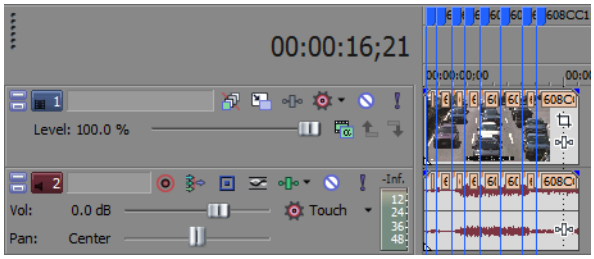

Markers are aligned with the start of captioning for paint-on captions or with the display time for pop-up style captions.

When the captioning markers are read, Vegas Pro creates an .scc file in the media file's folder using the same base name as the media file. The .scc file is used when you use the media in the future so the application doesn't need to scan the media again.

When you're finished editing your project, you can promote the embedded captioning markers to the timeline.

1. Select events with captions.
2. From the **Tools** menu, choose **Scripting**, and then choose **Promote Media Closed Captioning**.

   The markers appear as command markers on the timeline, and you can move and edit the markers as needed:




### Rendering captions

You can export captions in rendered media and in standalone .scc files.

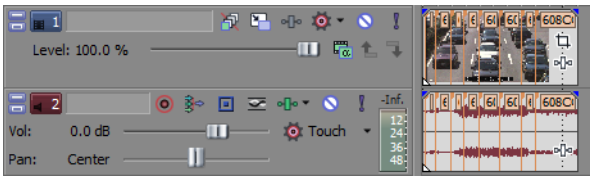
- When you render to XDCAM HD/XDCAM HD422 MXF formats, captioning markers are embedded in the media file. An .scc file is also created using the base name of the rendered media file.
- When you render to MPEG-2 format, captioning markers are encoded in ATSC format.
- When you render to a format that does not support embedded captioning markers, an .scc file is created using the base name of the rendered media file.

## Importing or rendering Line 21 closed captions

### Importing Line 21 captions

Vegas Pro reads embedded Line 21 captions when you import a media file with a frame size of 720x486 pixels (or taller) and a frame rate of 29.97 fps.

When you add media to the timeline or Trimmer, embedded captioning markers are displayed as media markers.



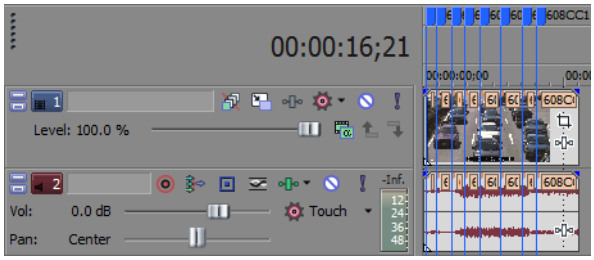

Markers are aligned with the start of captioning for paint-on captions or with the display time for pop-up style captions.

When the captioning markers are read, Vegas Pro creates an .scc file in the media file's folder using the same base name as the media file. The .scc file is used when you use the media in the future so the application doesn't need to scan the media again.

When you're finished editing your project, you can promote the embedded captioning markers to the timeline:

1. Select events with captions.
2. From the **Tools** menu, choose **Scripting**, and then choose **Promote Media Closed Captioning**.

   The markers appear as command markers on the timeline, and you can move and edit the markers as needed:



#### Rendering Line 21 captions

Line 21 captions are supported during rendering when using a frame size of 720x486 pixels (or taller) and a frame rate of 29.97 fps.

**Note:** *Encoding Line 21 captions for DVD is not supported. MPEG-2 video for DVD cannot exceed 480 lines of resolution. DVD Line 21 captions are embedded as metadata in the MPEG-2 video stream and are not supported.*

### Importing or printing captions when using HD SDI

#### Importing closed captions over HD SDI

Vegas Pro reads embedded VANC closed captioning when capturing video over HD SDI.

- During capture, Vegas Pro creates an .scc file in the media file's folder using the same base name as the captured file.
- If capturing to XDCAM HD422 format, closed captions are also embedded in the captured file.

#### Printing closed captions to tape over HD SDI

When you print to tape over HD SDI, closed captions are included as VANC data.

### Importing closed captions from a closed captioning file

If your media does not contain embedded captioning markers, you can import markers from an external file. The following file types are supported:

- Scenarist Closed Caption (.scc)

**Tip:** *If an .scc file matches the media file name, the captions will be read automatically when you load a file.*

*For example, if your video file is wildflowers.avi, naming your captioning file wildflowers.avi.scc will allow Vegas Pro to read the captions automatically.*

- RealPlayer Captioning Files (.rt)
- SubRip Subtitles (.srt)
- Windows Media Player Captioning Files (.smi)
- Transcript or QuickTime Captioning Files (.txt)
- CPC MacCaption Files (.mcc)

**Tip:** *If an .mcc file does not contain CEA608 captions, its CEA708 captions will be converted to CEA608 pop-up captions. Service 1 captions will be imported as 608CC1 captions, and Service 2 captions will be imported as 608CC3 captions.*

- DVD Architect Subtitles (.sub)

1. From the **File** menu, choose **Import**, and then choose **Closed Captioning** from the submenu.
2. In the Open dialog, browse to the file you want to use and click **Open**.

   The markers appear as command markers on the timeline, and you can move and edit the markers as needed.

**Tip:** *Captioning markers will be placed according to the timecode in the captioning file. If needed, you can adjust marker positions by applying a timeline ruler offset before importing the closed captioning.*

### Synchronizing captions with video

After you import captions, you may need to adjust timing to synchronize the markers with your video.

1. Use the procedure described earlier in this chapter to import captions.
2. Position your video events as desired in the timeline.
3. From the **View** menu, choose **Edit Details** to display the Edit Details window.
4. From the **Show** drop-down list, choose **Commands**. Your captioning commands are now displayed in the Edit Details window.
5. In the timeline, position the cursor where you want to start inserting captions.
6. Select a row in the Edit Details list to select the first caption you want to insert.
7. Click the **Play** button ( ) to start playback.
8. When you're ready to insert your first caption, press Ctrl+K. The first caption is inserted at the cursor position, the **Position** setting is updated, and the next caption is selected.
9. Press Ctrl+K to insert each subsequent caption.

### Adding or editing closed caption markers on the timeline

You can edit closed caption markers on the timeline to adjust caption start times, delete caption markers, edit their contents, or add new markers.

- To add a new marker, click to position the cursor on the timeline and then choose **Command** from the **Insert** menu (or press C).

> **Tip:** *To create a pop-on caption quickly, type your caption text in the* **Comment** *box in the Command Properties dialog. Caption markup is added automatically. You can use [BR] to indicate a line break.*

- To move a marker, drag the marker tag on the timeline.
- To delete a marker, right-click it and choose **Delete** from the shortcut menu.
- To edit a marker, double-click the marker tag.

Use the Command Properties dialog to edit the marker.

| Item | Description |
|---|---|
| **Command** | Choose **608CC1** for primary-language captions.<br>Choose **608CC3** for secondary-language captions.<br>**Notes:**<br>• *Vegas Pro also supports 608CC2 and 608CC4 commands for the CC2/CC4 channels.*<br>• *When rendering to XDCAM HD/HD422, CEA608 data is uplifted to CEA708 format so that CEA608 and CEA708 captions are available when playing via HD SDI. CEA608 CC1 is uplifted to CEA708 Service 1, and CEA608 CC3 is uplifted to CEA708 Service 2).* |
| **Parameter** | Displays the marker's captioning text. [BR] indicates a line break. |

| Item | Description |
|---|---|
| **Comment** | Type closed caption control commands here.<br>Commands must conform to standard caption markup, and command strings are case and space sensitive. *For more information about captioning markup, see Captioning markup reference and examples on page 293.*<br>**Tip:** *You can use your keyboard to create standard text and punctuation. To insert special characters and punctuation, use the Character Map (***Start** > **All Programs** > **Accessories** > **System Tools** > **Character Map***).*<br>For minor edits, you can ignore the markup and edit the displayed text. If you change the length of the text, be aware of the following:<br>• {R14In00Wh} means Row 14, Indent 00, White text.<br>• Row (two digits) ranges from 01 to 15.<br>• Indent (two digits) ranges from 00 to 28 but only in multiples of 4.<br>• {TabOff1} means Tab offset 1. Possible values (one digit) are 1, 2, or 3.<br>**Important:** *For each row, indent (In) plus tab offset (TabOff) plus the number of content characters cannot exceed 32.* |
| **Position** | Type the time you want the command to occur in your project. |

## Captioning markup reference and examples

### Pop-On Caption

A pop-on caption is displayed on the screen as a single element and is cleared or replaced with a new caption. Pop-on captions are most often used for prerecorded captioning.

{RCL}{ENM}{R14In00Wh}{TabOff1}First Row{R15In00Wh}{TabOff1}Second Row{EDM}{EOC}

**Tip:** *If you type captioning text in the* **Comment** *box of the Command Properties dialog and do not specify captioning markup, a pop-on caption is created.*

### Roll-Up Caption

A roll-up caption scrolls onto and off the screen two or three lines at a time and is most often used for live captioning.

{RU2}{CR}{R15In00Wh}{TabOff1}First Row

—or—

{RU3}{CR}{R14In00Wh}{TabOff1}First Row{R15In00Wh}{TabOff1}Second Row

—or—

{RU4}{CR}{R13In00Wh}{TabOff1}First Row{R14In00Wh}{TabOff1}Second Row{R15In00Wh}{TabOff1}Third Row

### Paint-On Caption

A paint-on caption appears on screen one letter at a time and displayed like a pop-on caption. Paint-in captions are most often used at the beginning of a program.

{RDC}{R14In04Wh}{TabOff3}First Row{R15In04Wh}{TabOff3}Second Row

### Captioning Markup

| Caption Markup | Description | Usage Notes |
|---|---|---|
| {RCL} | Resume Caption Loading | Starts a pop-on caption. |
| {RDC} | Resume Direct Captioning | Starts a paint-in caption. |
| {RU2} | Roll-Up Captions-2 Rows | Starts a two-line roll-up caption. |

| Caption Markup | Description | Usage Notes |
|---|---|---|
| {RU3} | Roll-Up Captions-3 Rows | Starts a three-line roll-up caption. |
| {RU4} | Roll-Up Captions-4 Rows | Starts a four-line roll-up caption. |
| {EDM} | Erase Displayed Memory | Cleans the display. Required to remove roll-up and paint-on captions from the screen. |
| {ENM} | Erase Nondisplayed Memory | Cleans buffered captions from memory. |
| {EOC} | End of Caption | In pop-up captions, EOC ends the current caption and displays the next caption. |
| {FlashOn} | Flash On | Causes the caption to blink until new foreground attributes are set. |
| {TabOff1} | Tab Offset 1 | For each row, indent (In) plus tab offset (TabOff) plus the number of content characters cannot exceed 32. |
| {TabOff2} | Tab Offset 2 | |
| {TabOff3} | Tab Offset 3 | |
| {Backspace} | Backspace | Used for live captioning. |
| {DelEndRow} | Delete to End of Row | Used for live captioning. |
| {CR} | Carriage Return | |
| {RyyWh} | Row *yy* [00 to 15], White Text | |
| {RyyWhU} | Row *yy* [00 to 15], White Underlined | |
| {RyyGr} | Row *yy* [00 to 15], Green Text | |
| {RyyGrU} | Row *yy* [00 to 15], Green Underlined | |
| {RyyBl} | Row *yy* [00 to 15], Blue Text | |
| {RyyBlU} | Row *yy* [00 to 15], Blue Underlined | |
| {RyyCy} | Row *yy* [00 to 15], Cyan Text | |
| {RyyCyU} | Row *yy* [00 to 15], Cyan Underlined | |
| {RyyRd} | Row *yy* [00 to 15], Red Text | |
| {RyyRdU} | Row *yy* [00 to 15], Red Underlined | |
| {RyyYl} | Row *yy* [00 to 15], Yellow Text | |
| {RyyYlU} | Row *yy* [00 to 15], Yellow Underlined | |
| {RyyMa} | Row *yy* [00 to 15], Magenta Text | |
| {RyyMaU} | Row *yy* [00 to 15], Magenta Underlined | |
| {RyyWhI} | Row *yy* [00 to 15], White Italics | |
| {RyyWhIU} | Row *yy* [00 to 15], White Italics Underlined | |
| {RyyInxxWh} | Row *yy* [00 to 15], Indent *xx* [00\|04\|08\|12\|16\|20\|24\|28], White Text | For each row, indent (In) plus tab offset (TabOff) plus the number of content characters cannot exceed 32. |
| {RyyInxxWhU} | Row *yy* [00 to 15], Indent *xx* [00\|04\|08\|12\|16\|20\|24\|28], White Underlined | |
| {WhTxt} | White Text | |
| {WhUTxt} | White Underlined | |
| {GrTxt} | Green Text | |
| {GrUTxt} | Green Underlined | |
| {BlTxt} | Blue Text | |
| {BlUTxt} | Blue Underlined | |
| {CyTxt} | Cyan Text | |
| {CyUTxt} | Cyan Underlined | |
| {RdTxt} | Red Text | |
| {RdUTxt} | Red Underlined | |
| {YlTxt} | Yellow Text | |
| {YlUTxt} | Yellow Underlined | |
| {MaTxt} | Magenta Text | |
| {MaUTxt} | Magenta Underlined | |
| {ITxt} | Italicized Text | |
| {IUTxt} | Italicized Underlined | |

| Caption Markup | Description | Usage Notes |
|---|---|---|
| {BgWh} | Background White | |
| {BgWhSemi} | Background Semitransparent White | |
| {BgGr} | Background Green | |
| {BgGrSemi} | Background Semitransparent Green | |
| {BgBl} | Background Blue | |
| {BgBlSemi} | Background Semitransparent Blue | |
| {BgCy} | Background Cyan | |
| {BgCySemi} | Background Semitransparent Cyan | |
| {BgRd} | Background Red | |
| {BgRdSemi} | Background Semitransparent Red | |
| {BgYl} | Background Yellow | |
| {BgYlSemi} | Background Semitransparent Yellow | |
| {BgMa} | Background Magenta | |
| {BgMaSemi} | Background Semitransparent Magenta | |
| {BgBlk} | Background Black | |
| {BgBlkSemi} | Background Semitransparent Black | |
| {BgTran} | Background Transparent | |
| {BlkTxt} | Black Text | |
| {BlkUTxt} | Black Underlined | |
| {StdCharSet} | Standard Character Set | You can use the character set commands to switch between character sets in your captions. For example, if you needed to display Korean characters in an English-captioned program, you could use {KORCharSet} to display Korean characters and then use {StdCharSet} to switch back to English captions. |
| {DSzCharSet} | Double Size Character Set | |
| {1PCharSet} | First Private Character Set | |
| {2PCharSet} | Second Private Character Set | |
| {CHNCharset} | People's Republic of China Character Set | |
| {KORCharSet} | Korean Character Set | |
| {1RgCharSet} | First Registered Character Set | |
| {TH} | Time Holder | Not used when creating new captions.<br>When you're working with existing captions, captioning data can be transferred ahead of the display time, and {TH} can be used to adjust the display time. |

### Displaying closed captions in the Video Preview or Trimmer window

You can preview your captions by using overlays in the Video Preview window.

> **Tip:** *Overlay settings from the Video Preview window are also applied to the video monitor in the Trimmer window.*

1. Click the down arrow next to the **Overlays** button ( ) and choose a setting from the menu to turn on the caption type that you want to preview.
2. Play your project.

### Exporting closed captions

Some Webcasting formats require that captions be saved in an external file. After creating your captions, you can export them to several formats.

1. Create and edit your captions as described in this chapter.
2. From the **Tools** menu, choose **Scripting**, and then choose a command from the submenu.

| Item | Description |
|---|---|
| **Export Closed Captioning for DVD Architect** | Creates a subtitle (.sub) file that can be used by DVD Architect software. The .sub file contains timecode values and text that will be used to create subtitle events in DVD Architect. |
| **Export Closed Captioning for QuickTime** | Creates a text (.txt) and .smil file for each subtitle service. The text file contains the captions and formatting, and the .smil file contains information that defines how captions will display on the media file.<br>The .smil file links to a .mov file that uses the same base name as your exported captions file by default. You can edit the file to refer to the desired media file name.<br>**Tip:** *If you're using QuickTime Pro, you can create a QuickTime text track to embed captions in your video file.* |
| **Export Closed Captioning for RealPlayer** | Creates a RealText (.rt) and .smil file for each subtitle service. The RealText file contains the captions and formatting, and the .smil file contains information that defines how captions will display on the media file.<br>The .smil file links to a .rm file that uses the same base name as your exported captions file by default. You can edit the file to refer to the desired media file name. |
| **Export Closed Captioning for Windows Media Player** | Creates a .smi and .asx file for each subtitle service. The .smi file contains the captions and formatting, and the .asx file contains information that defines how captions will display on the media file.<br>The .asx file links to a .wmv file that uses the same base name as your exported captions file by default. You can edit the file to refer to the desired media file name. |
| **Export Closed Captioning for YouTube** | Creates an .srt file that can be used for YouTube captions and by some DVD authoring software.<br>*For information about adding subtitles to your YouTube videos, please see http://www.youtube.com/t/captions_about.* |

3. Use the Save dialog to specify a file name and folder for your captions file, and then click **Save**.

### Editing multiple captions with the Edit Details window

The Edit Details window allows you to see all of your project's captions at once for quick editing.

You can even edit multiple captions at once. For example, if you wanted to change your 608CC1 (primary language) captions to 608CC3 (secondary language), perform the following steps.

1. From the **View** menu, choose **Edit Details** to display the Edit Details window if it isn't already visible.
2. In the Edit Details window, choose **Commands** from the **Show** drop-down list. Your closed caption markers are displayed.
3. Select the captions you want to edit:
   a. Hold Shift and click in the **Command** column for the first caption you want to change.
   b. Hold Shift and click in the **Command** column for the last caption you want to change.

      All captions between the first- and last-selected rows are selected.
4. Right-click the **Command** column for any selected caption and choose **Edit** from the shortcut menu.
5. Type a new value in the box — in this case, you'd type **608CC3** — and press Enter.

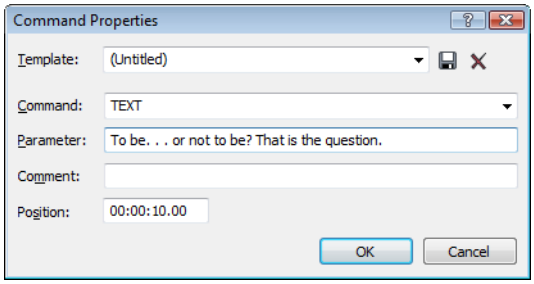
   All selected captions are changed to 608CC3.

## Adding captions to Windows Media Video (WMV) files

Captions makes your final video accessible to a wider audience. You can use text commands to add captions line-by-line to a Windows Media® Video (WMV) file, or for longer projects, you can add captioning from a script.

### Adding captions line-by-line

1. Position the cursor where you want the caption text to appear.
2. From the **Insert** menu, choose **Command**. The Command Properties dialog appears.




3. From the **Command** drop-down list, choose **Text**.
4. In the **Parameter** box, enter the closed captioning text you want to display.
5. Click **OK**.
6. Repeat steps 1-5 for each line of closed captioning text you want to add.
7. Render your file in Windows Media Video format. *For more information, see Rendering a project on page 363.*

**Tip:** *Take steps to ensure that the captions are displayed when the video is played. For more information, see Displaying captions on page 300.*

### Adding captions from a script

Using a script to generate captions involves several steps. First, you must copy and paste the lines from the script into a spreadsheet. You can create the spreadsheet from scratch (using the steps that follow) or use the sample shell (Vegas Captioning Shell.txt) provided in the Sample Projects folder on the Vegas Pro application disc. You can open this tab-delimited shell with a spreadsheet application or, in the absence of a spreadsheet application, any text editor.

When the spreadsheet is complete, you can copy and paste the lines into the Edit Details window. You can set the position for each line of captioning during playback.

#### Creating a script spreadsheet

1. Create a four-column, tab-delimited spreadsheet.
2. In the first column, enter 00:00:00:00 in each of the cells as a placeholder. You will set the actual position of each line during playback.
3. In the second column, enter TEXT in each of the cells to specify the command type.
4. In the third column, enter the text that you want to display as a caption. Enter each line in its own cell.

**Tip:** *If you have a script, you can copy and paste individual lines into the cells.*

5. In the fourth column, enter a label to identify your captions. An entry such as Line 001 can help you sort the captions once you paste them into your Vegas Pro project.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 00.00.00.00 | TEXT | But, soft! What light through yonder window breaks? | Line 001 |
| 2 | 00.00.00.00 | TEXT | It is the east, and Juliet is the sun. | Line 002 |
| 3 | 00.00.00.00 | TEXT | Arise, fair sun, and kill the envious moon, | Line 003 |
| 4 | 00.00.00.00 | TEXT | Who is already sick and pale with grief, | Line 004 |
| 5 | 00.00.00.00 | TEXT | That thou her maid art far more fair than she: | Line 005 |
| 6 | 00.00.00.00 | TEXT | Be not her maid, since she is envious; | Line 006 |
| 7 | 00.00.00.00 | TEXT | Her vestal livery is but sick and green | Line 007 |
| 8 | 00.00.00.00 | TEXT | And none but fools do wear it; cast it off. | Line 008 |
| 9 | 00.00.00.00 | TEXT | It is my lady, O, it is my love! | Line 009 |
| 10 | 00.00.00.00 | TEXT | O, that she knew she were! | Line 010 |
| 11 | 00.00.00.00 | TEXT | | Line 011 |

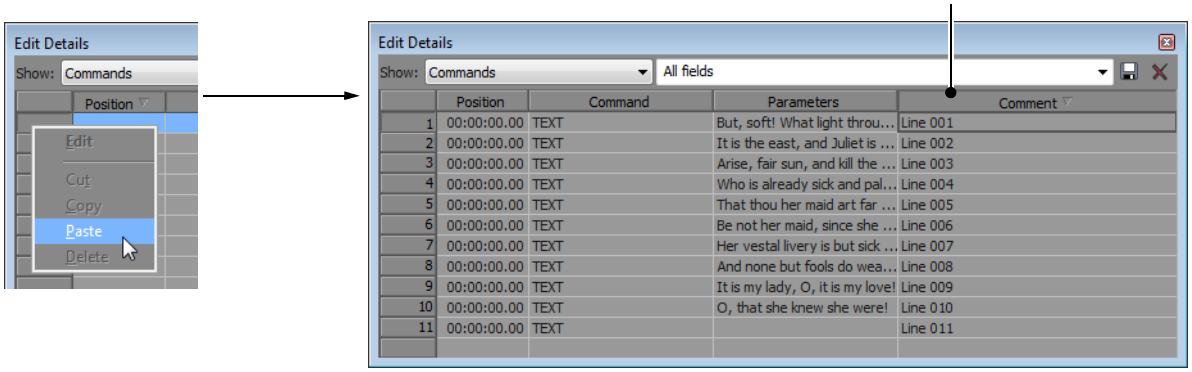
**Note:** *The final caption is displayed in the Microsoft® Windows Media® Player until the end of the video. To clear the final caption sooner, add a final command with no text (as shown above).*

### Copying and pasting captions into Vegas Pro software

1. Select the cells in the spreadsheet and copy them.
2. Switch to Vegas Pro software and choose **Edit Details** from the **View** menu. The Edit Details window appears.
3. From the **Show** drop-down list, choose **Commands**.
4. Right-click the gray box in the upper-left corner and choose **Paste** from the shortcut menu. The spreadsheet data is pasted into the Edit Details window.
5. Click the column header for the Comments column. This sorts the captions by line number.

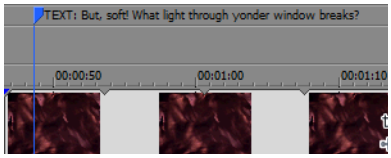
Right-click to paste the spreadsheet contents into the Edit Details window.

Click the Comments column header to sort the captions by line number.


Edit Details
Show: Commands
Position
Edit
Cut
Copy
Paste
Delete
Edit Details
Show: Commands
All fields
Position
Command
Parameters
Comment
1 00:00:00.00 TEXT But, soft! What light throu... Line 001
2 00:00:00.00 TEXT It is the east, and Juliet is ... Line 002
3 00:00:00.00 TEXT Arise, fair sun, and kill the ... Line 003
4 00:00:00.00 TEXT Who is already sick and pal... Line 004
5 00:00:00.00 TEXT That thou her maid art far ... Line 005
6 00:00:00.00 TEXT Be not her maid, since she ... Line 006
7 00:00:00.00 TEXT Her vestal livery is but sick ... Line 007
8 00:00:00.00 TEXT And none but fools do wea... Line 008
9 00:00:00.00 TEXT It is my lady, O, it is my love! Line 009
10 00:00:00.00 TEXT O, that she knew she were! Line 010
11 00:00:00.00 TEXT Line 011

### Setting caption timing

1. Position the cursor shortly before where you want the first caption to occur.
2. Select the row for the first caption in the Edit Details window.
3. Click the **Play** button ( ) to start playback.
4. When playback reaches the place where the first caption should occur, press Ctrl+K. The first caption is inserted at the cursor position, updates the **Position** setting in the Edit Details window, and selects the next caption.




5. Press Ctrl+K to insert each subsequent caption.

6. Render your file in Windows Media Video format. *For more information, see Rendering a project on page 363*.

### Displaying captions

You can use one of two methods for displaying the captions when the video is played:

- Instruct your audience to turn on captions:

  In Windows Media Player 8: from the **View** menu, choose **Now Playing Tools**, and then choose **Captions** from the submenu.

  In Windows Media Player 9 and 10: from the **Play** menu, choose **Captions and Subtitles**, and then choose **On if Available** from the submenu.

  In Windows Media Player 11 and 12: from the **Play** menu, choose **Lyrics, captions, and subtitles**, and then choose **On if available** from the submenu.
- Create an HTML page with the Windows Media Player embedded in it. See the Vegas Pro online help for a sample HTML page.

Chapter 17

# Using Video Effects, Compositing, and Masks

Video plug-ins in Vegas® Pro software include effects and generators. Effects cover a broad range of electronic modifications that can be used to improve substandard video or artistically enhance a production. Generators can be used to create custom video events such as credit rolls or gradient overlays.

A variety of options are provided in compositing video and using masks. Compositing involves mixing visual elements together into a final output. Multiple compositing modes are provided from which to choose. Masks, which are used extensively in television and movies, are an important part of creating overlays. Together, these professional tools can help you polish your productions.

**Note:** *The compositing model in Vegas Pro 6.0 and later differs significantly from the Vegas Pro 4.0 model. To reproduce the Vegas Pro 4.0 parent/child masking behavior, set the compositing mode of the parent track to* **Multiply***, and then apply the Mask Generator plug-in as a track effect on the parent track.*

## Applying video effects

There are several methods available for applying effects to video. Video plug-ins can be applied to tracks, video events, source media files (via the Project Media window), or to the entire video project.

The mix of video effects applied at different levels (to events, tracks, files, etc.) is important to the final mix of a project. *For more information, see Video signal flow on page 36.*

In general, effects are applied in the following order:

- To files in the Project Media window
- To events
- To tracks
- To the project (video output effects)

**Tips:**

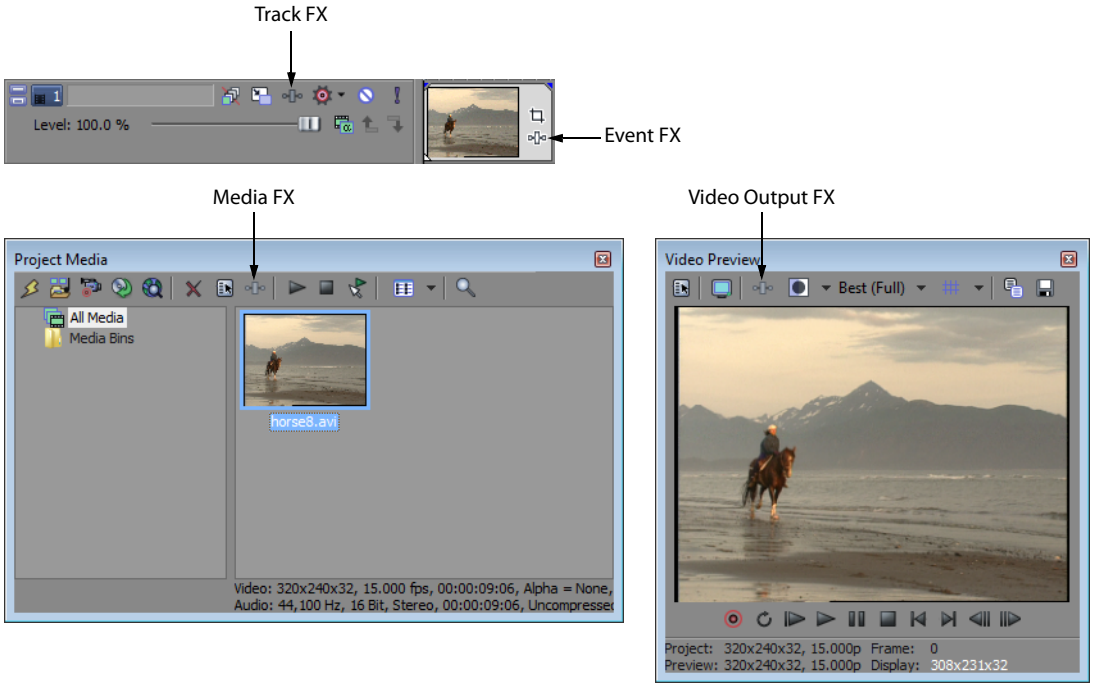
- *To apply a preset without displaying the Video FX dialog, hold the Shift key while dragging a preset from the Video FX window to a track header, event, or the Video Preview window.*
- *To add effects quickly, you can drag plug-ins from the Plug-In Manager window to events, tracks, and the Video FX or Video Preview windows.*
- *To move effect controls in fine increments, hold Ctrl while dragging the control.*
- *Double-click the title bar of the Video FX window to resize it for the current plug-in.*

**Notes:** *Video plug-ins and media generators that support floating-point processing are included in the* **32-bit floating point** *folder in the Transitions, Video FX, Media Generators, Compositors, and Plug-In Manager windows.*

### Adding video effects to a track, event, media file, or project

1. Click the **FX** button ( ) in the location where you want to add video effects.
   - Click the **Event FX** button on a video event to apply an effect to a single event. The Video Event FX window is displayed
   - Click the **Track FX** button on a track header to apply an effect to every event on a track. The Video Track FX window is displayed.
   - Click the **Media FX** button in the Project Media window or hold Alt while clicking the **FX** button () on an event to apply an effect to every occurrence of a media file in your project (the source media file is not affected). The Media FX window is displayed.

- Click the **Video Output FX** button in the Video Preview window to apply an effect to every video event in your project. The Video Output FX window is displayed.




2. Add the effects that you want to use to the Video FX dialog:
   - From the **View** menu, choose **Video FX** to display the Video FX window. Select an effect in the left pane. The thumbnail images in the right pane represent each of the existing presets for the selected effect. Hover your mouse pointer over a preset to see an animated example, and drag the preset you want to use to the Video FX dialog.
   - Click the **Plug-In Chain** button ( ) in the Video FX dialog to display the Plug-In Chooser. Select each plug-in you want to add and click the **Add** button. Click **OK** to close the Plug-In Chooser.

> **Tip:** *To reorder the plug-ins within the chain, drag a plug-in button to a new location.*

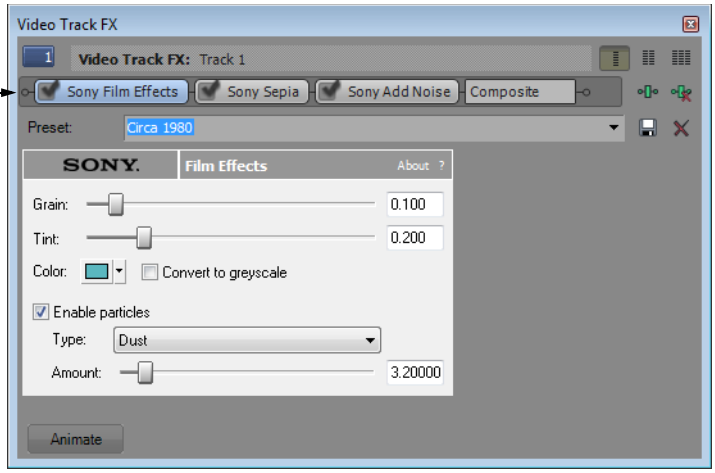
3. Use the Video FX window to enable/bypass effects, edit effect parameters, and add/remove effects from a chain.

### Editing existing video effects

1. Click the **FX** button ( ) in the location where you want to edit video effects. The Video FX dialog is displayed.
2. Select an effect button at the top of the window.

> **Tip:** *Clear the check box to bypass an effect without removing it from the chain. When you're working with a stereoscopic 3D project, a separate check box is displayed for the left- and right-eye video:* Stereoscopic 3D Adjust *. By limiting an effect to the left or right eye only, you can use multiple instances of a plug-in with different settings for each eye.*

3. Use the controls in the bottom half of the window to adjust the effect's settings.
4. Click the **Remove Selected Plug-In** button ( ) to remove the current plug-in from the chain.




Plug-in chain

Click a plug-in to modify its settings in the lower part of the window.

Clear the check box on a plug-in to bypass it.

Drag a plug-in to move it within the chain.

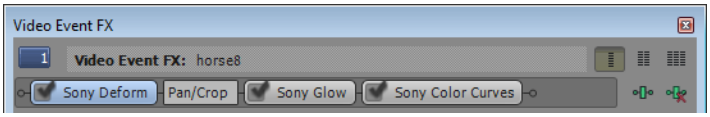
### Saving custom video effect settings as a preset

1. Click the **Preset** text box. The name of the current preset is highlighted.
2. Type a new name for the preset and click the **Save** button ( ).

**Tip:** *To use a saved custom preset, simply choose it from the drop-down list.*

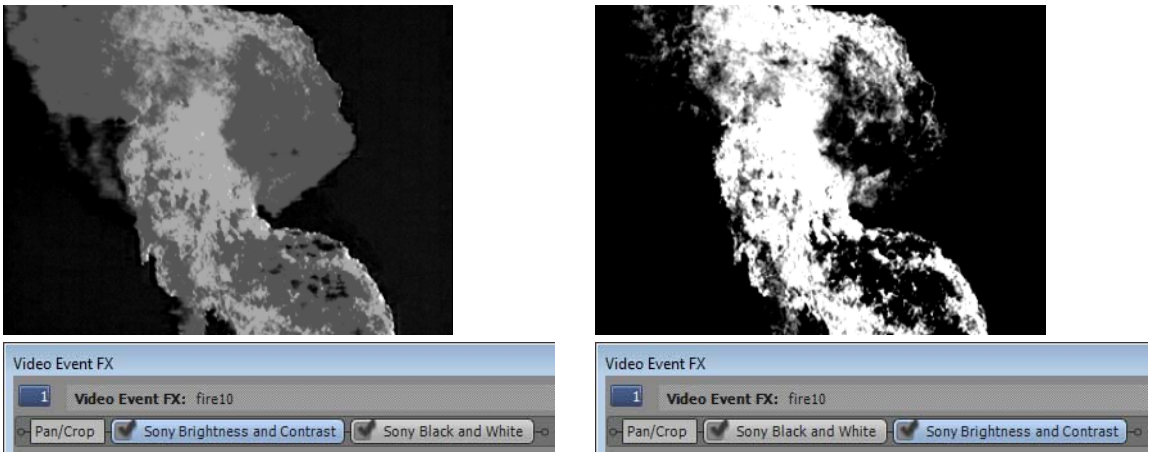
### Applying video event effects before or after event panning or cropping

To prevent unwanted blurring, you can choose whether effects are applied to the event before or after any event panning and cropping by arranging the **Pan/Crop** button in the plug-in chain at the top of the Video Event FX window.




Here, the Deform plug-in is applied before the pan/crop and the Glow and Color Curves plug-ins are applied after the pan/crop.

In the following illustration, you can see how the order of plug-ins is important.

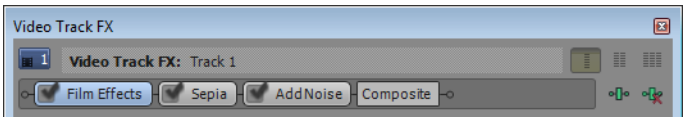



The goal of the above example is to use video effects plug-ins to create a very high-contrast mask out of a video clip of fire. In the image on the left, a Brightness and Contrast plug-in is applied first and then a Black and White plug-in. In the image on the right, the Black and White plug-in was applied first, removing the color, and then the Brightness and Contrast plug-in was applied. The mask created by the second example is much cleaner, even though all of the settings of the two plug-ins are identical.

### Applying video track effects before or after track compositing

When you add effects to a video track, you can specify whether the effects are applied before or after compositing.

You can choose whether an effect is applied pre- or post-compositing by arranging the **Composite** button in the plug-in chain at the top of the Video Track FX window.




### Bypassing all video effects

You can use the **Split Screen View** button ( ) in the Video Preview window to create a split-screen preview that bypasses all video effects (track effects, event effects, media effects, and video output effects) without removing them from your project.

### Animating a video effect

If you want to create an animated effect, use the keyframe controller at the bottom of the Video Event FX window to establish distinct settings throughout the duration of the effect.

During playback, intermediate frames are interpolated to create smooth motion. For more information about keyframe animation, see *Using keyframe animation on page 330* and *Animating video effects plug-ins on page 337*.

### Automating video output effect parameters with the bus track

You can think of Vegas Pro as having a single video bus: when you have multiple tracks, they are all composited to a single video output.

When you choose **Video Bus Track** from the **View** menu, a bus track is displayed for the video output. You can add keyframes to adjust effect parameters over time.

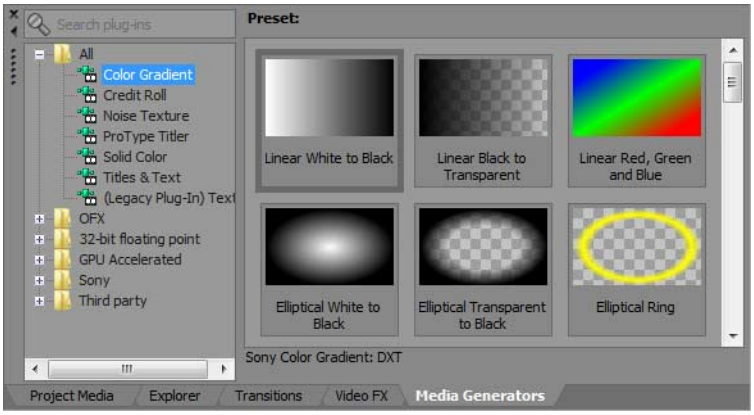
*For more information about using the video bus track, see Using video bus tracks on page 160.*

### Learning more about a specific plug-in

The video plug-ins that are installed on your system will vary depending on the version of the software that you are using. For more information about a specific plug-in, click the **Plug-In Help** button ( ) in the Video Event FX, Video Track FX, Media FX, or Video Output FX window to access online help.

## Using generated media

Generated media plug-ins are a special class of plug-in that creates virtual media files contained in events on the timeline. These virtual files are stored in the Project Media window, where their properties can be viewed and modified.




Generated media provide an easy way to add text, backgrounds, or test patterns to your project. You can view the generators by choosing **Media Generators** from the **View** menu to display the Media Generators window.

Generated media events can be animated using keyframes. *For more information, see Using keyframe animation on page 330 and Animating generated text on page 338.*

For help on a specific plug-in, click the **Plug-In Help** button (?) in the Video Media Generators window to access online help.

### Adding a generated media event

1. Position the cursor where you want to create the event.
2. Select the media generator you want to use:
   - From the **View** menu, choose **Media Generators** to display the Media Generators window. Select a generator in the left pane. The thumbnail images in the right pane represent each of the existing presets for the selected generator. Hover your mouse pointer over a preset to see an animated example, and drag the preset you want to use to the timeline.

     —or—
   - From the **Insert** menu, choose **Generated Media**. The Plug-In Chooser is displayed. Select the plug-in you want to use and click **OK**.

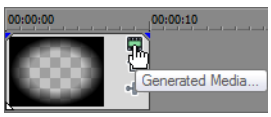
   The Video Media Generators dialog appears.
3. In the Video Media Generators dialog, type values in the **Frame size** and **Length** boxes to specify the size and duration of the generated media.
4. Use the controls in the Video Media Generators dialog to adjust the plug-in's settings.

**Tips:**

- *To create a generated media event quickly, drag a preset thumbnail from the Media Generators tab to the timeline. A new event is created where you drop the thumbnail using the preset's parameters.*
- *A generated media event is ten seconds long as a default. However, you can trim the event to any length. For more information, see Trimming an event on page 81.*

### Editing a generated media event

1. Click the **Generated Media** button on an event. The Video Media Generators dialog appears.



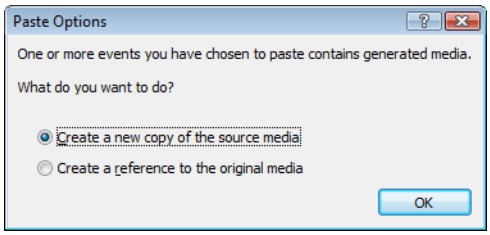
2. Use the controls in the Video Media Generators dialog to adjust the plug-in's settings.
   - Click the **Match Event Length** button ( ) to set the length of the generated media to match the length of the event.
   - Click the **Media Properties** button ( ) to edit information about the generated media, such as the frame size, frame rate, field order, pixel aspect, and rotation.
   - Click the **Replace Plug-In** button ( ) to change the media generator for the current event.
   - Use the lower portion of the Video Media Generators dialog to choose a new preset or adjust the plug-in's settings.

### Duplicating a generated media event

You can duplicate generated media events using copy and paste commands, by holding Ctrl while dragging an event to a new position on the timeline, or by dragging generated media from the Project Media window to the timeline.

When you duplicate a generated media event, a dialog is displayed with two options:

- **Create a new copy of the source media** The new event is created using the same settings as the original event. Each event can be edited independently.
- **Create a reference to the original media** The new event uses the same source media as the original generated media event. Any change to either event affects both events.

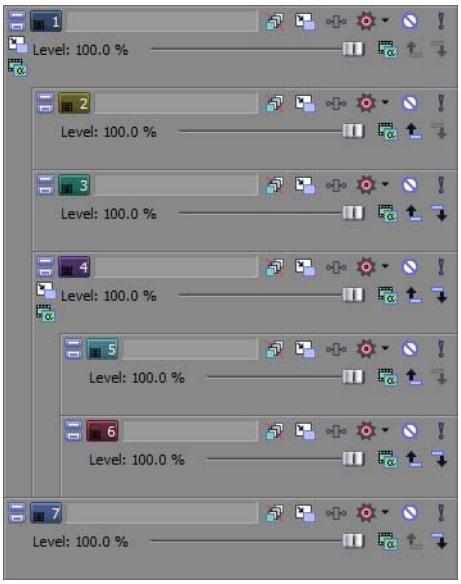

Paste Options
One or more events you have chosen to paste contains generated media.
What do you want to do?
Create a new copy of the source media
Create a reference to the original media
OK

## Compositing

Compositing is the process of mixing visual elements together into a final output. In Vegas Pro software, this means mixing tracks together vertically. Masks, generated text, and chroma keying all involve compositing. Understanding how compositing works is important to understanding these and many other video track mixing techniques.

### Understanding the parent/child track relationship

The key to understanding overlays, masks, transparency, and compositing is to understand the parent/child relationship between tracks. In general terms, the parent track is the highest track in a group of tracks (often only two) and the behavior of the child tracks (that is, how they are composited together) is determined by the parent track.



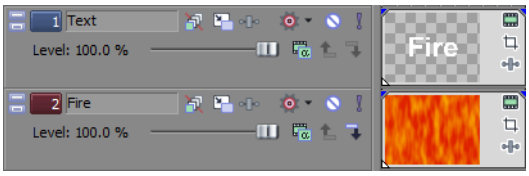
You can also produce complex compositing by creating nested parent/child groups with compositing parents and children at various levels.

When you have multiple levels of parent and child tracks, clicking the **Make Compositing Child** button ( ) moves the track in one level and clicking the **Make Compositing Parent** button ( ) moves out one level.

Hold Ctrl while clicking the **Make Compositing Child** button to move a track and all its child tracks in one level.

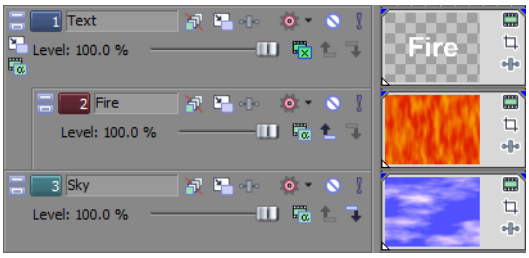
The following three examples demonstrate different compositing relationships.

The first example shows two independent tracks. The top track contains a generated text event that has a transparent background. The second track therefore shows through the transparent areas in the Video Preview window. Since the second track does not have any transparent areas, any tracks below it would be completely obscured.



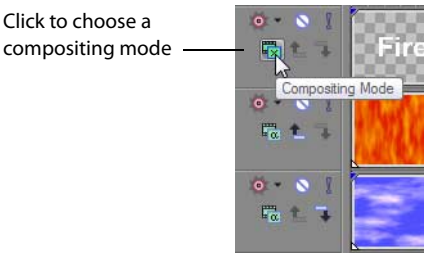
In the second example, track two is the child track of track one (the parent track), and the compositing mode of track one is set to **Mask**. This parent/child relationship was set up by clicking the **Make Compositing Child** button ( ) in the track list for track two. This makes the text in track one act as a mask over track two, allowing the fire to show through the mask (that is, the text). The region outside of the text is still transparent, but there is nothing below these tracks, so it appears black.

In the third example, a generated media event was added to the track below the first two tracks, which are already paired in a parent/child relationship. The color gradient event in track three shows through the transparent area of the top two paired tracks.



### Selecting compositing modes

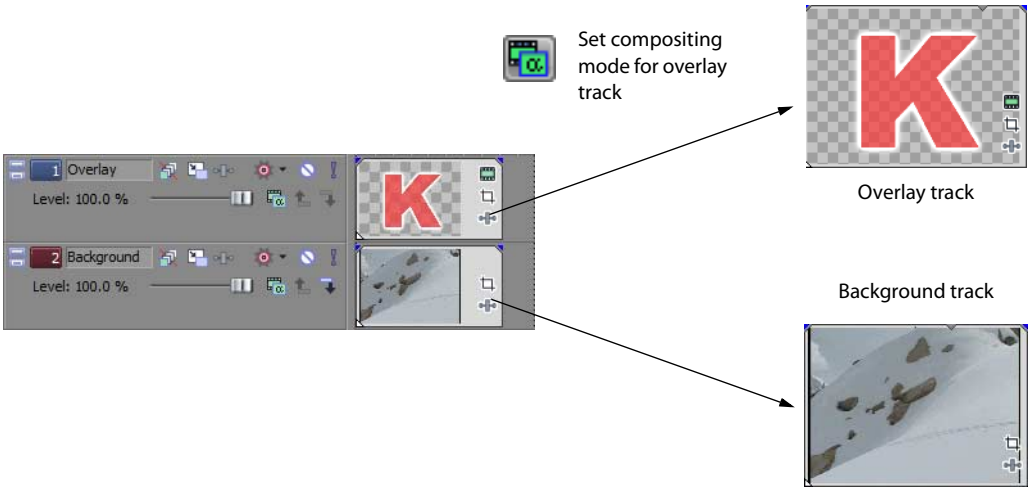
The **Compositing Mode** button ( ) determines how the transparency in a video track is generated. Because lower tracks show through higher tracks, it is the compositing mode of the higher track that determines how much of the lower track shows though.




**Note:** *The compositing mode of the lowest video track is a special case. Selecting a mode for the lowest track affects its transparency against a black background.*

To select a compositing mode, click the **Compositing Mode** button and choose a mode from the menu that appears, or choose **Custom** to customize compositing with a 2-to-1 transform plug-in.

The sample below uses a generated text event that is partially transparent. *For more information, see* *Using generated media on page 305*.




The following table shows how these two sample tracks are blended using each of the compositing modes.

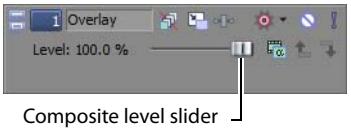
| Compositing mode | Sample | Description |
|---|---|---|
| **Add** | | Adds the overlay color values to the background. |
| **Subtract** | | Subtracts the overlay color values from the background. |
| **Multiply (Mask)** | | Multiplies the overlay color values by the background color values. This makes overlay colors stronger and more present and results in a darker video image. The opposite of this mode is Screen. |

| Compositing mode | Sample | Description |
|---|---|---|
| **Source Alpha** | | Uses the alpha channel to determine transparency in the overlay.<br>This compositing mode is based on the alpha channel characteristics of an event or media file. If no alpha channel is present in the overlay, the Source Alpha compositing mode has no effect. |
| **Cut** | | Cuts out the overlay color values from the background. |
| **Screen** | | Multiplies the inverse of the overlay color values with the background color values. This makes overlay colors weaker and less present and results in a lighter video image. The opposite of this mode is Multiply. |
| **Overlay** | | Heightens contrast by using Multiply mode on darker colors and Screen mode on lighter colors. |
| **Hard Light** | | Adds overlay colors as if the overlay were lit by a bright, focused spotlight. |
| **Dodge** | | Brightens the background based on the overlay color values. |
| **Burn** | | Darkens the background based on the overlay color values. |
| **Darken** | | Compares the overlay and background pixel by pixel and selects the darker color value for each pixel. |
| **Lighten** | | Compares the overlay and background pixel by pixel and selects the lighter color value for each pixel. |
| **Difference** | | Compares the overlay and background pixel by pixel and subtracts the darker color value from the lighter color to generate a new color value (difference). |

| Compositing mode | Sample | Description |
|---|---|---|
| **Difference Squared** | | Remaps color values along a parabolic curve. The color values of the layers in the composite group are subtracted, and then the subtracted values are squared.<br>The resulting image will have less extreme changes in color values as the colors approach black (RGB 0,0,0) and more extreme changes in color values as colors approach white (RGB 255,255,255). |

#### Adjusting opacity with the composite level slider

You can precisely control the transparency or blending of the overlay with the composite level slider. Left is transparent and right is 100 percent opaque. You can also double-click the current value to enter a specific numeric percentage.




Composite level slider

### Using a 2-to-1 transform plug-in to customize compositing

Click the **Parent Composite Mode** ( ) or **Composite Mode** button and choose **Custom** from the menu to use plug-ins to control how the parent track modifies the tracks in its composite group.

The included Displacement Map, Height Map, and Bump Map plug-ins can create interesting lens, mirror, water, fire, and other light-bending effects. These plug-ins are explained below:

- Displacement Map: Uses the parent image as a guide to offset the pixels in the composited child tracks along the horizontal and vertical axes. The X and Y offsets are independently encoded in the image color channels.
- Height Map: Uses the parent image as a guide to offset the pixels in the composited child tracks. The gradient of the image in the parent track is used to determine the amount of offset for the image displayed at that location, much like how light bends through a lens.
- Bump Map: Uses the parent image as a guide to add texture and lighting to the composited child tracks. The texture of the bump map is applied to the composited child tracks: light sections of the map represent high areas, and dark sections represent low areas.

## 3D compositing

With 3D compositing, you can move video tracks anywhere in space to simulate realistic motion and lighting.

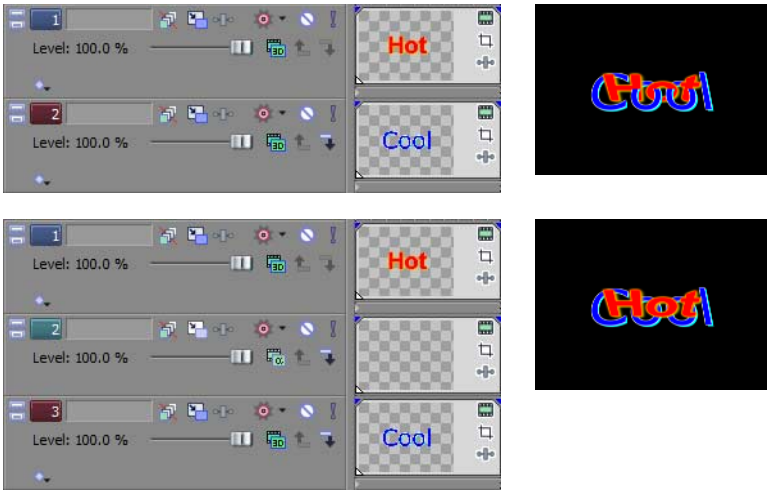
With 2D compositing (and in previous versions of Vegas Pro software), you can move video or images along the X or Y axes, and you can rotate video along the Z axis. With 3D compositing, you can move or rotate along the X, Y, or Z axes to create distance, depth, and perspective.

There are two basic rules to 3D compositing:

1. When you have a 2D track in the track list, 3D tracks below that track are rendered in 3D and then composited as a 2D image.
2. A 2D track at the root level (flush to the left of the track list) acts as a barrier to interaction between 3D tracks.

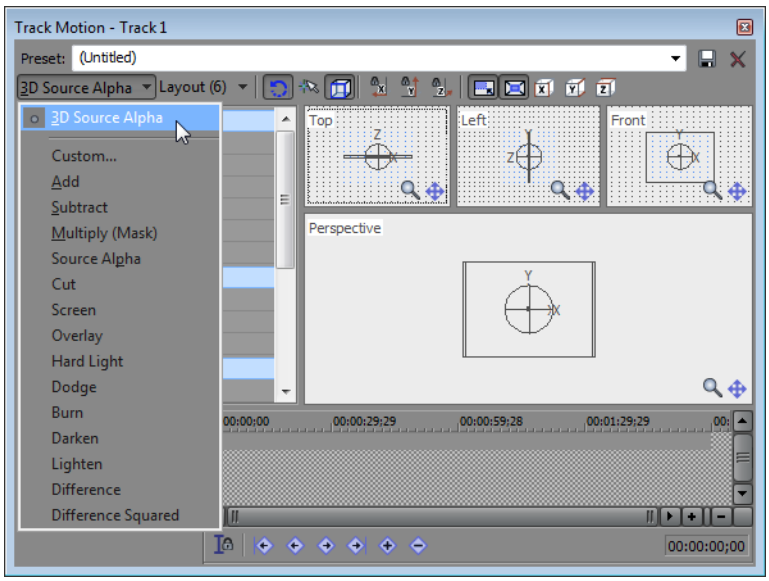
In the following examples, both text tracks have been rotated in 3D: the “hot” track is rotated toward the user, and the “cool” track is rotated away from the user.

In the first example, the two tracks intersect along their rotation axis. In the second example, adding a 2D track above the “cool” track causes it to be rotated in 3D and composited as a 2D image so the “hot” text is displayed above it without intersecting.

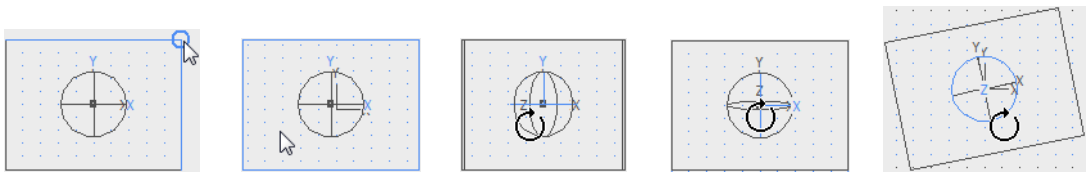



### Single-track 3D motion

1. Click the **Track Motion** button ( ) on the track that contains the overlay that you want to animate. The Track Motion window is displayed.
2. From the **Compositing Mode** drop-down list, choose **3D Source Alpha**.




3. Choose a setting from the **Layout** drop-down list to choose the workspace display that you want to use. The **Layout** setting allows you to see your track from various points of view.
4. Adjust the selection area to change the viewable area of the track and its position in space. Guides are displayed in bold to indicate how the track will be moved or rotated:



Moving closer to or farther from viewer. Drag across corners to flip the track.

Dragging the track.

Rotating left to right around the Y axis.

Rotating forward or backward around the X axis.

Rotating around the Z axis.

5. Use the buttons at the top of the dialog to allow or prevent movement or scaling. *For more information, see Changing editing options on page 314.*

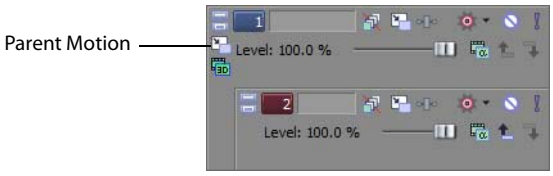
> **Tip:** *Right-click the workspace to display a shortcut menu that displays commands to restore, center, or flip the selection box. You can also force the box to match the source media's aspect ratio or your project's output aspect ratio. Matching the output aspect ratio can prevent black bars from appearing when you use source media (such as photographs) that does not match your project's aspect ratio.*

6. The 3D track motion occurs instantly, and the results are updated in the Video Preview window.
7. Use the keyframe controller at the bottom of the Track Motion window to establish distinct track motion settings throughout the duration of the track.

   During playback, immediate frames are interpolated to create smooth motion. Expand the **Keyframe interpolation** heading on the left side of the window and drag the **Smoothness** slider to adjust the interpolation. *For more information, see Using keyframe animation on page 330.*

### Composited group 3D motion

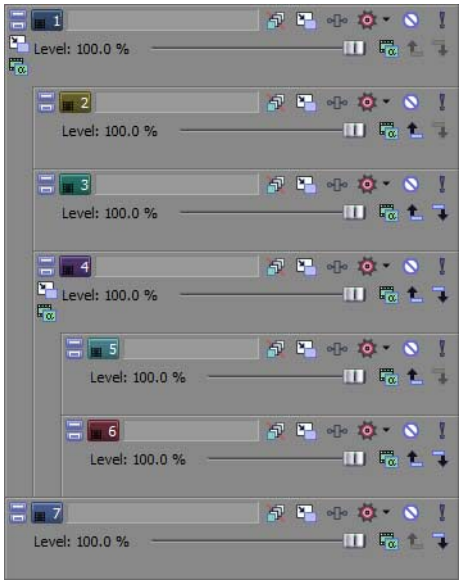
1. Click the **Make Compositing Child** button ( ) on the tracks you want to group to create a compositing group. *For more information, see Understanding the parent/child track relationship on page 306.*
2. Click the **Parent Composite Mode** button ( ) on the parent track and choose **3D Source Alpha**.
3. Click the **Parent Motion** button ( ) on the parent track. The Track Motion window is displayed.




Parent track motion affects the parent track and all child tracks.

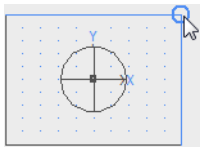
In the sample track list below, parent track motion on track 1 will affect tracks 1 through 6.

Parent track motion applied to track 4 will affect only tracks 4 through 6.

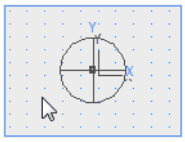



4. Choose a setting from the **Layout** drop-down list to choose the workspace display you want to use. The **Layout** setting allows you to see your track from various points of view.

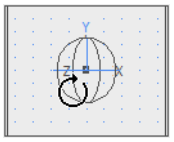
5. Adjust the selection area to change the viewable area of the track and its position in space. Guides are displayed in bold to indicate how the track will be moved or rotated:



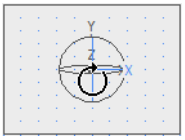
Moving closer to or farther from viewer. Drag across corners to flip the track.



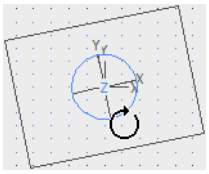
Dragging the track.



Rotating left to right around the Y axis.



Rotating forward or backward around the X axis.



Rotating around the Z axis.

6. Use the buttons at the top of the dialog to allow or prevent movement or scaling. *For more information, see Changing editing options on page 314.*

**Tip:** *Right-click the workspace to display a shortcut menu that displays commands to restore, center, or flip the selection box. You can also force the box to match the source media's aspect ratio or your project's output aspect ratio. Matching the output aspect ratio can prevent black bars from appearing when you use source media that does not match your project's aspect ratio.*

7. The 3D track motion occurs instantly, and the results are updated in the Video Preview window.
8. Use the keyframe controller at the bottom of the Track Motion window to establish distinct track motion settings throughout the duration of the track.

   During playback, immediate frames are interpolated to create smooth motion. Expand the **Keyframe interpolation** heading on the left side of the window and drag the **Smoothness** slider to adjust the interpolation. *For more information, see Using keyframe animation on page 330.*

### Applying a stereoscopic 3D camera

The Stereoscopic 3D Camera controls allow you to add stereoscopic depth to 3D track compositing elements.

1. Set up your project as a stereoscopic 3D project. *For more information, see Setting up your stereoscopic 3D project on page 123.*
2. Add 2D media to the timeline.
3. Click the **Track Motion** button (). The Track Motion window is displayed.
4. From **Compositing Mode** drop-down list, choose **3D Source Alpha**.
5. Click the **Expand** button () next to the **Stereoscopic 3D Camera** heading on the left side of the Track Motion window. The **Lens Separation** and **Depth Adjust** controls are displayed.
6. Use the **Lens Separation** and **Depth Adjust** controls to set the depth of your media:

| Item | Description |
|---|---|
| **Lens Separation** | Type a value in the box (or click the down arrow button () to display a slider you can drag) to set the distance between the lenses in your virtual stereoscopic 3D camera.<br>The setting represents a percentage of the frame width. For presentation on a 40-inch HDTV, the value typically would not exceed 7 percent. For theatrical projection, the value typically would not exceed 0.5 percent. |
| **Depth Adjust** | Type a value in the box (or click the down arrow button () to display a slider you can drag) to displace the left-and right-eye images to set the depth of your 3D image. You usually want all of the action behind the screen plane, only crossing the screen plane for dramatic or special effect. However, make sure never to create divergence, where the left-eye picture would appear more than 2.5 inches to the left of the right-eye picture on the largest screen where your movie will be shown.<br>A value of 0 represents screen depth; positive values push action behind screen depth, and negative values push action in front of screen depth. |

## Changing editing options

Use the toolbar at the top of the Track Motion window to change your editing options.

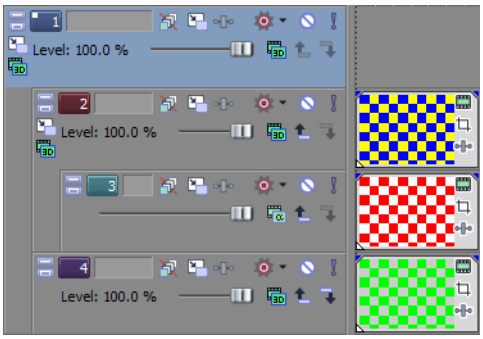
| Icon | Command | Description |
|---|---|---|
| | **Enable Rotation** | Select this button if you want to be able to rotate, or spin, the video.<br>When the button is not selected, video is locked so you can move it along the X, Y, or Z axis, but the event will not rotate. |
| | **Enable Snapping to Grid** | Select this button if you want your editing to snap to the grid. |
| | **Edit in Object Space** | Select this button if you want to edit in the object's space rather than the camera's space.<br>For example, if a video object is rotated, its X axis may not correspond to the X axis of the of the Video Preview window. Selecting the **Edit in Object Space** button in conjunction with the Prevent Movement buttons allows you to move the object along its own X, Y, and Z axes. |
| | **Prevent Movement (X)** | Select this button if you want to prevent horizontal movement of the track. |
| | **Prevent Movement (Y)** | Select this button if you want to prevent vertical movement of the track. |
| | **Prevent Movement (Z)** | Select this button if you want to prevent movement of the track along the Z axis (closer to or farther from the viewer). |
| | **Lock Aspect Ratio** | Select this button if you want the selection box to retain its aspect ratio during resizing.<br>When the button is not selected, the height and width can be resized independently. |
| | **Scale About Center** | Select this button if you want the selection box to retain its center point when you resize the box by dragging its edges.<br>When the button is not selected, the opposite side of the selection box will remain anchored when you drag the edges to resize it. |
| | **Prevent Scaling (X)** | Select this button if you want to lock the horizontal dimension of the selection box. |
| | **Prevent Scaling (Y)** | Select this button if you want to lock the vertical dimension of the selection box. |
| | **Prevent Scaling (Z)** | Select this button if you want to lock the Z-axis dimension of the selection box. |

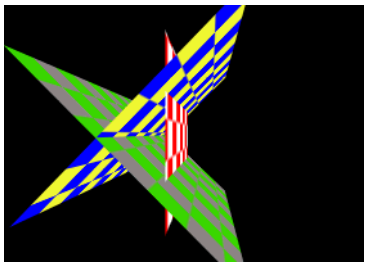
## Examples of various 3D compositing scenarios

In the following examples, track two (blue-and-yellow checkerboard) is rotated forward in 3D space, track 4 (green-and-gray checkerboard) is rotated backward in 3D space, and track 3 (red-and-white checkerboard) is a 2D track.

Track 1 is used to rotate tracks 2 through 4 so you can see the compositing interaction.

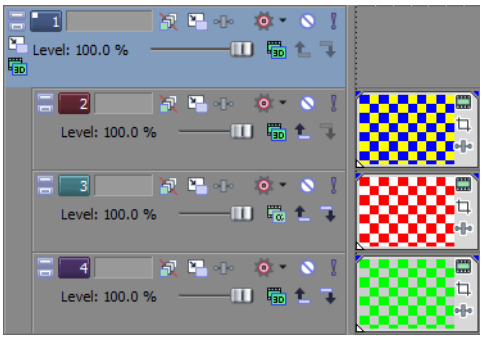
In the first example, the 2D track is a compositing child to track 2. The 2D child is inserted in the composited output at a depth of zero on the Z axis, and tracks 2 and 4 intersect in 3D space.

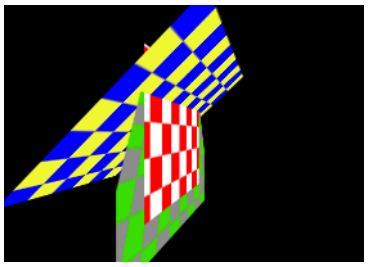


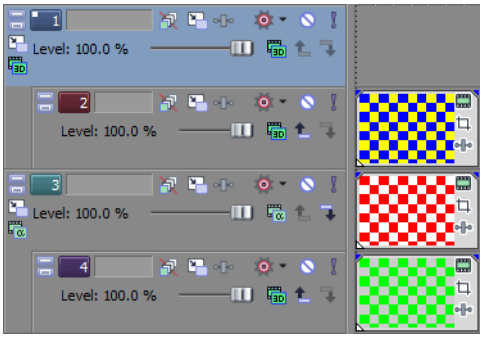
In the next example, clicking the **Make Compositing Parent** button ( ) on track 3 forces the track below (at the same compositing level) to be rendered in 3D and composited as a 2D image.

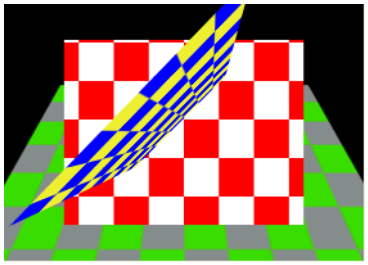
Track 4 (green-and-gray checkerboard) now has the appearance of depth—the checkerboard tapers to a vanishing point—but is inserted in the composited output as a 2D image at a depth of zero on the Z axis. Track 2 is still rotated in 3D space.



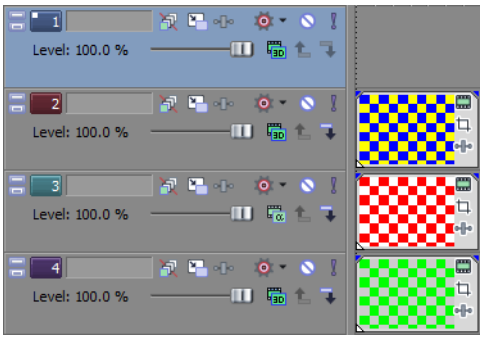



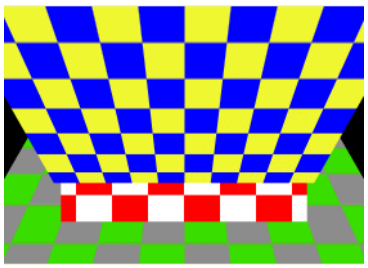
In the next example, clicking the **Make Compositing Parent** button ( ) on track 3 again forces the track below (at the same compositing level) to be rendered in 3D and composited as a 2D image. However, in this case, the 3D rotation that was applied as parent motion on track 1 is not applied to tracks 3 and 4.



In the next example, all tracks are compositing parents. The 3D track on track 2 is on top, the 2D track in track 3 is composited below track 2, and the 3D track in track 4 is composited below tracks 3 and 4.



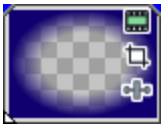
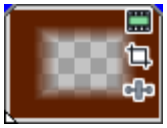



## Creating masks

Masks are used to create overlays, limit the effects of a filter, and to create transparent titles. In their simplest form, masks work by making a particular color in an image or video transparent. More complex effects can be created with gradients (smoothly blending transparent areas together) and by altering the sensitivity of the mask.

### Creating image masks

You can use media generated by Vegas Pro software to create simple masks. You can also create masks from just about any image file.

Masks created using color gradient generated media events

1. Create an image of a solid white circle on a black background in any paint program. This will be the mask.
2. Add the mask image file as an event into the top-most track on the timeline.
3. Insert a video event just below the mask track. This is the background video behind the mask and is the event that is masked.
4. Click the **Make Compositing Child** button ( ) located in the track list of the background video (lower) track. This makes the lower track the child of the mask track (the parent track).
5. Click the **Compositing Mode** button ( ) on the mask track and choose **Multiply (Mask)** from the menu.

In the following example, the white circle is a .bmp image file. Black is 100% opaque and white is completely transparent.

Masks can also be partially transparent. By using gradients and grayscale images, you can achieve smooth blending. Black is still 100% transparent and white is opaque, but the grays in between are only partially opaque.

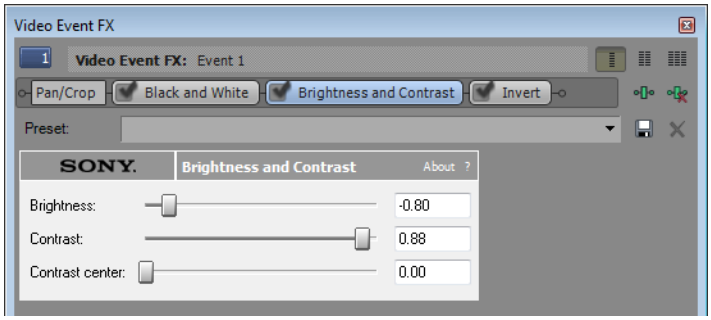
The effects of the masks are very clear in these examples, but this is not how they would actually be used in a real production. Masks are commonly used to isolate a portion of the video from an effect. Masks do not need to be black and white, or grayscale, nor do they need to be still images.

**Tip:** *It is best to use images that are the same size as your project's frame size. You may also need to change the pixel aspect ratio of an image file to get it to display correctly. For more information, see* *Correcting images for DV pixel aspect ratios on page 271 and Modifying media file properties on page 284.*

### Creating video masks

You can also use video files to create masks, although the process can be more complicated than using an image as a mask. The key to any mask is contrast. You can increase the difference between the light and dark areas of a video file using video effects plug-ins.

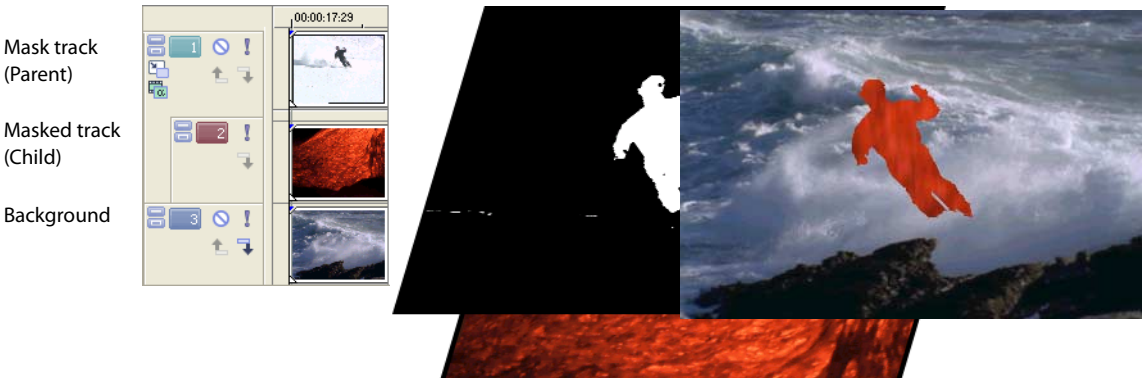
1. Insert the video that you want to use as a mask into a video track.
2. Drag a Black and White plug-in from the Video FX window to the event to remove the color. *For more information, see Applying video effects on page 301*.
3. Drag a Brightness and Contrast plug-in from the Video FX window to the event.
4. Adjust the Brightness and Contrast to create the mask. Watch the Video Preview window for a real-time preview of the mask. Adjust the effect so that parts of the video are completely black (opaque) and other parts are completely white (transparent). This can often mean increasing the contrast while decreasing the brightness.




5. If necessary, mask areas can be inverted (reversing the black and white areas) with an Invert plug-in or by selecting the **Invert** check box in the Mask Generator window. *For more information, see Using the Mask Generator on page 319*.

Original color event | Black and White plug-in | Brightness and Contrast plug-in | Invert plug-in

After you have created the mask, place it in the highest track. Add another video event to another track below the mask and click the **Make Compositing Child** button ( ) on that track. Any video that appears in a lower track below the Parent mask track and its Child shows through the areas outside of the mask. The entire setup is pictured in the following illustration.



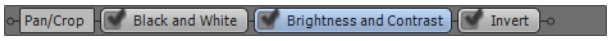
### Bézier masks

You can use the Pan/Crop plug-in to create masks using Bézier curves. *For more information, see Creating a Bézier mask on page 265.*

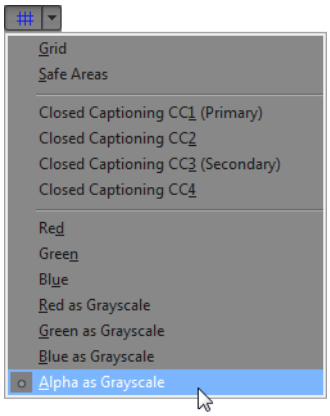
### Fine-tuning masks

Depending on the source material, creating a clean mask can be a tricky exercise. There are a few tools and tricks you can use to fine tune a mask.

- **Solo the track** Click the **Solo** button ( ) in the track list to isolate the masked track. This allows you to concentrate exclusively on the mask.
- **Toggle effects** Turn individual plug-ins on and off to isolate effects in a plug-in chain. Keep in mind that the order of the plug-ins in the chain is important in determining the final composited output.

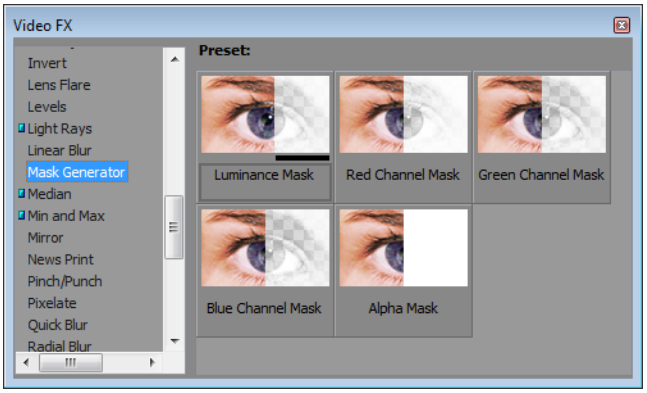



- **Isolate channels** Isolate individual color channels in the Video Preview window by clicking the **Overlays** button ( ). Click the arrow on the button to select the specific channel to be isolated and whether to display this channel in grayscale only. Then click the main button to toggle the channel display on and off. The **Alpha as Grayscale** option isolates the alpha channel mask and displays it in grayscale. *For more information, see Understanding the Video Preview window on page 345.*



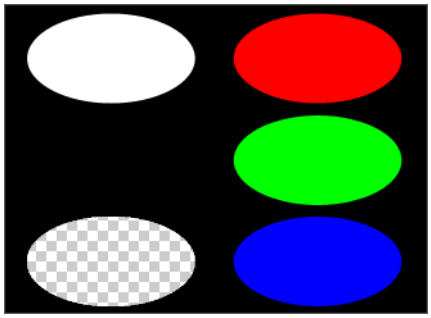
## Using the Mask Generator

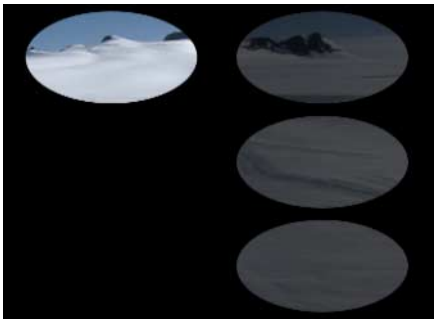
The Mask Generator is a plug-in that controls the transparency of events to be used as masks when you use events that are not grayscale. Apply the plug-in to an event (or a track) in the same way as any other plug-in: just drag-and-drop. The Mask Generator plug-in can be found in the Video FX window (from the **View** menu, choose **Video FX**).




### How the Mask Generator works

The following illustration demonstrates some of the effects of the Mask Generator. The background image is the original mask. There are five ellipses on the mask: white, red, green, blue and an invisible alpha channel. Note especially the checkered ellipse in the lower left of the mask; this is the alpha channel. You can base the alpha channel on a color or define the alpha channel in a graphics program that supports alpha channel creation. Masks with alpha channels must be saved in a format that supports this method of transparency, such as PNG or TGA. As in this example, the alpha channel may be invisible in the actual mask.





Luminance

Mask track (Parent)

Masked track (Child)

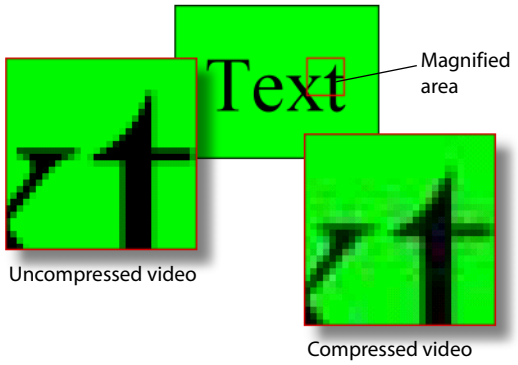
Blue

The top-right example uses luminance to determine the transparency in the mask. The white area is completely transparent. Since white is made up of 100% values of red, green, and blue (255,255, and 255), those three colors are all 33% transparent as well. In the lower-right example, blue is the selected transparent index. The blue area is 100% transparent and so are all areas that have a value of 255 for blue (0,0,255), including white (255,255,255).

### Chroma keying

Chroma keying or bluescreening is a special case of overlay transparency. A color key is a specific color or a range of similar colors in an image that are made transparent, allowing a background video to show through. The idea is to take a video subject and film it against a solid, uniform background color. It is critical that the color be smooth and uniformly lit with no shadows, and that the color chosen for the background not be used in the subject.

The most important factors in successful blue screening happen during shooting, well before the footage is imported into Vegas Pro software. Compression of the source video is also an important consideration. While almost all video is compressed in some way, highly compressed video does not key well because colors can be smeared together and edges tend to not be very sharp.

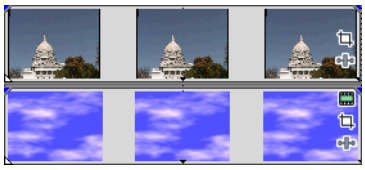


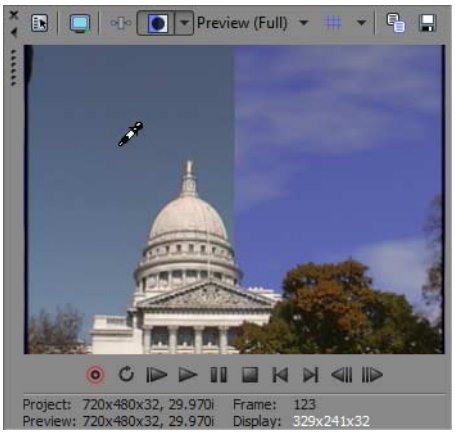

If your source footage is good and the captured video file is also of high quality, color keying is an easy process.

1. Insert a video with a blue (or any solid colored) background into a track. This is the overlay video.
2. Insert the background video that will show through the blue areas into the next lower track.

> **Note:** *You do not need to set the lower track as a child track when using the Chroma Keyer plug-in as you would with a mask.*

3. Click the overlay video (foreground, higher track) to select it.
4. Drag a Chroma Keyer plug-in from the Video FX window onto the overlay video. The Video Event FX window displays.
5. Click the down arrow to the left of the **Split Screen View** button ( ) on the Video Preview window and choose **FX Bypassed**. This will bypass the effect of the Chroma Keyer plug-in until you are ready to view the effect.
6. In the Video Event FX window, click the **Pick Color from Screen** button ( ). The cursor changes to an eyedropper icon.
7. Draw (click and drag) a small rectangular selection area around the color(s) to key out. Although you can select the color range from just about anywhere, the Video Preview window is the best location.






> **Note:** *Other effects that can change the color of the event should be bypassed when using the Pick Color from Screen tool.*

8. Click the **Split Screen View** button ( ) on the Video Preview window to restore the video effects. The Video Preview window shows the result of the Chroma Keyer plug-in.

When a subject is filmed against a solid colored background in a studio, you can key out the background color using the Mask Generator or the Chroma Keyer plug-in. You can select a wider range of colors using the Chroma Keyer plug-in, making it the perfect tool for less-than-perfect blue screens.

This procedure selects a small range of colors to use as a key. In the example above, the blue sky around the dome is far from uniform and it would be difficult to key it out with a traditional blue screen key. The color is uniform enough, however, that a range of blues can be selected directly from the preview image. Use the controls at the bottom of the dialog box to determine the sensitivity of the colors selected. Since the filter selects a range of colors, it is a good idea to try to select a relatively small range of similar colors. Drawing a color selection area that spans both blue and red colors would make very large sections of an overlay transparent.

**Tip:** *It is possible to use multiple Chroma Keyer plug-ins on a single event, keying out the blues with one and the reds with the other, without keying out any colors between blue and red.*

Chapter 18

# Adding Video Transitions and Motion

Want something other than a cut or crossfade between video events? Vegas® Pro software provides a wide variety of transitions you can add to your project. This chapter also covers track motion and keyframe animation, which allows you to automate video effects, media generators, cropping, panning, and more.

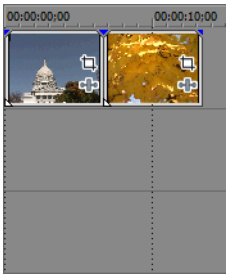
## Understanding basic transitions

Transitions occur between two video events. Most professional productions, on television or on the big screen, use only two types of transitions. The first is a simple cut, where one scene immediately cuts to the other without delay or effects. The other is a fade, otherwise known as a crossfade or a dissolve.

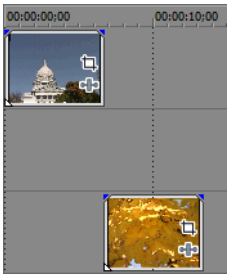
### Cuts

A cut is actually not a transition. Instead, the last frame from an event is immediately followed by the first frame of the next event. This is what happens with two adjacent events on the timeline, either in the same track or in different tracks. This can also happen when an event is punched into another (with fade edge edits turned off).

Adjacent events




Events on different tracks



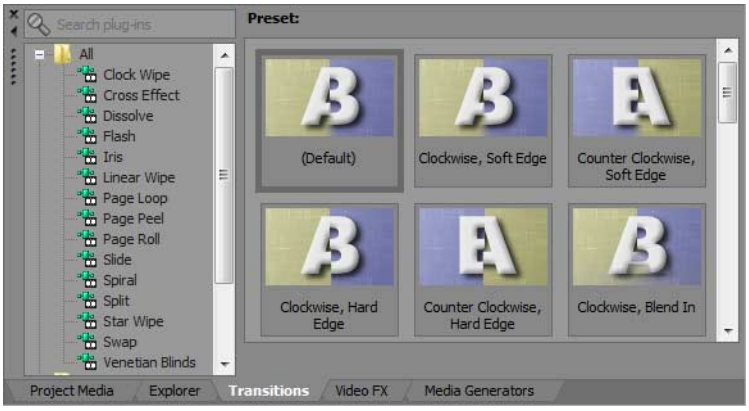

Punch-in events

### Crossfades

You can fade one event out and fade into the next event by simply overlapping the two. The duration of the transition is determined by the amount of overlap. *For more information, see Crossfading events on page 90.*

## Using transition effects

Transition effects are more complex than a simple cut or crossfade. You can replace a crossfade with a transition and then customize the transition to meet your needs.




### Tips:

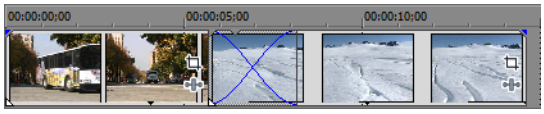
- *To apply a preset without displaying the Video Event FX dialog, hold the Shift key while dragging a preset from the Transitions window to the timeline.*
- *To move transition controls in fine increments, hold Ctrl while dragging the control.*
- *Select* **Event Fade Lengths** *from the* **View** *menu to display fade lengths between selected and nonselected events in the timeline. You can use this display as a quick indicator of a transition's length.*
- *Double-click the title bar of the Video FX window to resize it for the current plug-in.*

### Adding a transition

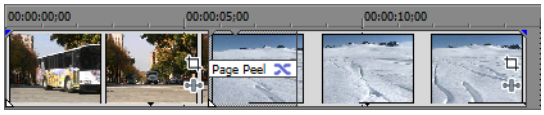
1. Insert a video event onto the timeline.
2. Insert another event so that it overlaps the first to create an automatic crossfade.
3. In the Transitions window, browse for a transition effect. If the Transitions window is not visible, choose **Transitions** from the **View** menu.
4. Drag the effect onto the crossfade between the two events.

**Note:** *The duration of a transition is automatically determined by the amount of overlap between the two events. As with other events, you can control the precise duration of a transition by dragging the edges in and out. You can also slide a transition for more precise control. For more information, see* *Sliding a crossfade* on page 91.

The original crossfade...



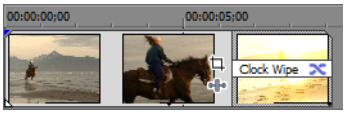

...and the new transition effect.




**Tip:** *Some transitions also have their own shortcut keys. On the numeric keypad, press / to insert a crossfade, * to insert a dissolve, and - to insert a linear wipe. Hold Ctrl while pressing / to convert the transition to a cut at the cursor position.*

### Adding a transition to the end of an event

Typically, a transition occurs between two events on a track, but you can also use transitions to fade to and from the background, whether that is an underlying image, video, or background color. For example, you can drag a Clock Wipe transition to the end of a video event and have the wipe go from the video event to black.




### Adding a transition to all selected events

If you tend to use the same transitions often, you can save yourself some time by adding a transition to all selected events at once.

1. Select the events where you want to add the transition.
2. From the **View** menu, choose **Transitions** to display the Transitions window.
3. Select a transition from the list on the left side of the window. The thumbnail images on the right side of the window represent each of the existing presets for the selected transition. Hover your cursor over a preset to see an animated example.
4. After you've found the setting that you want to use, drag it to the position where you want it to occur on the timeline.
5. The Video Event FX dialog is displayed to allow you to edit the transitions settings, and a transition icon ( ) is displayed in the timeline to show you where the transition takes place. You can also click this icon to edit the transition's settings.

#### Dropping on existing cuts, crossfades, or transitions

- If you drop the preset on an existing transition, only transitions within the selection will be changed. Cuts and crossfades are preserved.
- If you drop the preset on an existing crossfade, only crossfades and transitions within the selection will be changed. Cuts are preserved.
- If you drop the preset on an existing cut, all cuts, crossfades, and transitions within the selection will be changed.

#### Dropping on event edges

- If you drop the preset on a transition that is at the beginning or end of an event (but does not span two events), only single-event transitions that occur on the same end of the event within the selection will be changed.
- If you drop the preset on an event fade-in or -out, event fade-ins/outs and single-event transitions that occur on the same end of the event within the selection will be changed.
- If you drop the preset on an event edge with no fade, all other event edges, event fade-ins/outs, and single-event transitions that occur on the same end of the event within the selection will be changed.

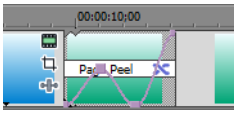
**Note:** *To change the length of the transition for cuts that are converted to transitions, use the Cut-to-overlap conversion settings on the* **Editing** *tab of the Preferences window. For more information, see* *Editing tab on page 427*.

### Adding a transition progress envelope

Normally, a transition progresses from 0 to 100% in a linear fashion over the length of the transition. A transition progress envelope gives you complete control over a transition: you can hold, reverse, and repeat individual transitions.

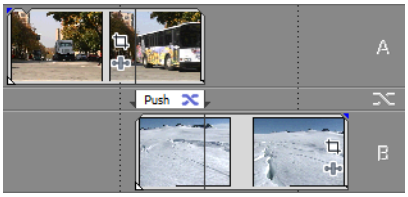
1. Right-click a transition.
2. From the shortcut menu, choose **Insert/Remove Envelope**, and then choose **Transition Progress** from the submenu. An envelope is added to your transition.
3. Add points and adjust the fade curves as desired. *For more information, see Using the Envelope Edit tool on page 174.*

In the following example, the transition starts, progresses to 50%, reverses direction, and then finishes.



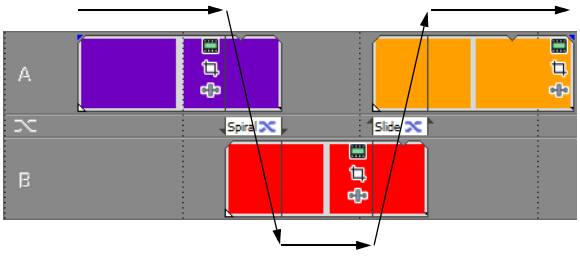

### Understanding track layers

If you want, you can view and modify transitions in an A/B roll mode. Right-click the track header and choose **Expand Track Layers** from the shortcut menu to expand the track to reveal three layers within the main track. These layers are called the A roll, the B roll, and the transition roll.




The concept of an A/B roll is fundamentally different from the multitrack philosophy. Every track is in some way mixed (composited) into the final output in a multitrack system, but events are not mixed on the A/B roll. Instead, either the A roll or the B roll is playing, with the two trading places during a transition. You could mix the two for as long as you want with a transition, but they do not blend without an intervening transition. Transitions move from one roll and into the other. This could be from A to B or from B to A. The direction of the transition is automatically set. The small arrows on the side of the transition event indicate this direction.

As the sequence below shows, the video output can shift from the A to the B and back to A many times during a production, but there is only one video output from any particular roll at a time. This means that the A and B rolls are not composited.



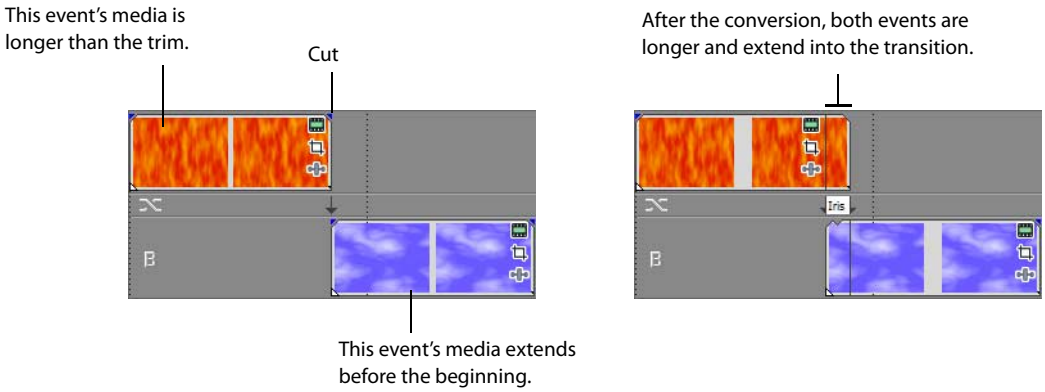
### Converting a cut to a transition

The transition between two events that are adjacent to each other on the same track is instantaneous and is called a cut. However, if the first event is trimmed back from the end and the second event is trimmed back from the beginning (in other words, both have enough media to overlap), you can transform the cut into a transition effect using this extra media.

1. Right-click the line between two adjacent events at the cut position.
2. From the shortcut menu, choose **Transition** and then choose the transition that you want to insert (for example, **Insert Sony Iris**).

You can also drag a transition to the cut from the Transitions window.

The duration of the newly inserted transition event is determined by the **Cut-to-overlap conversion** time set in the **Editing** tab of the Preferences dialog. To access this dialog, choose **Preferences** from the **Options** menu.


This event's media is longer than the trim.
Cut
This event's media extends before the beginning.
After the conversion, both events are longer and extend into the transition.
Iris

**Notes:**

- *There must be enough media in the respective events to cover the transition (for example, the end of the first event must not be the end of the media file).*
- *You can also convert cuts between audio events to crossfades. Click the cut and press / on the numeric keypad to create a crossfade. There must be enough media on either side of the cut to create the crossfade.*

### Converting a crossfade or transition to a cut

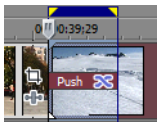
1. Click to position the cursor within the transition.
2. Hold Ctrl while pressing the / key on your numeric keypad.

   The transition will convert to a cut, using the Cut-to-overlap conversion settings on the **Editing** tab of the Preferences dialog to determine where the cut occurs. *For more information, see Editing tab on page 427.*

### Previewing a transition

The easiest way to preview a transition is to set the loop region to the duration of the transition and then loop the playback. This allows you to adjust the transition while it is playing and make changes in real time.

1. Double-click the transition. This automatically creates a time selection equal to the length of the transition.




2. Click the **Loop Playback** button ( ) to turn loop playback on. The selection area bar is dark blue when loop playback is turned on.
3. Click the **Play** button ( ).

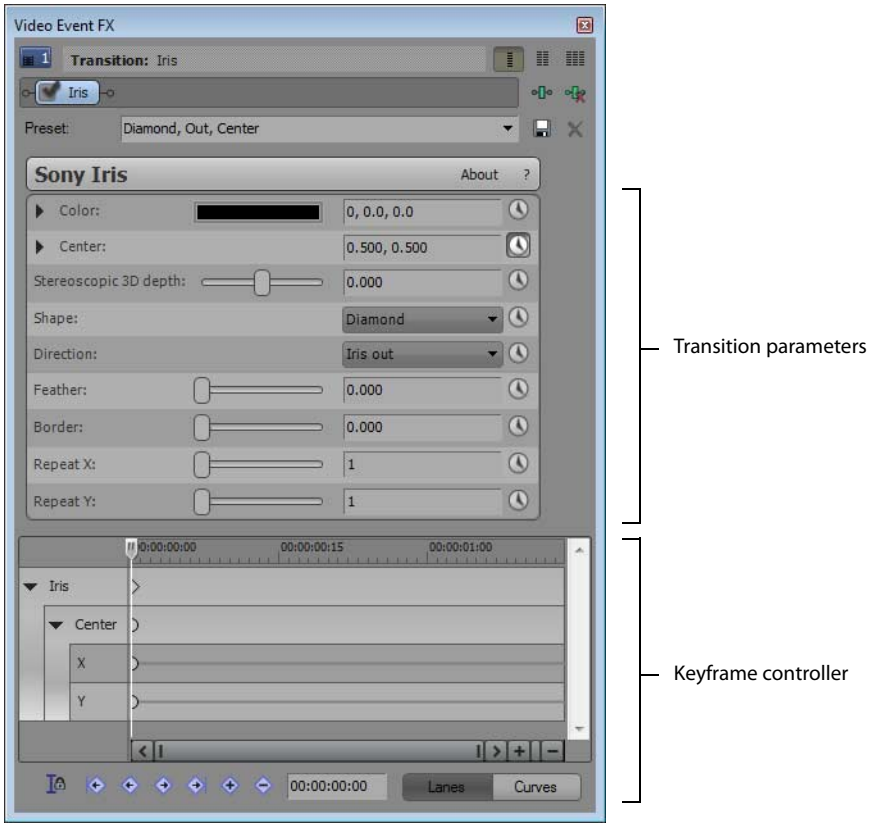
To preview complicated transitions, you may want to build a dynamic RAM preview or prerender the effect. *For more information, see Building dynamic RAM previews on page 348 or Prerendering video on page 347.*

### Modifying a transition

All of the transitions include several presets that create standard transitions. If a preset doesn't meet your needs, you can customize a transition to suit your taste.

**Tip:** *You can also animate the parameters of a transition with keyframes. For more information, see Using keyframe animation on page 330.*

1. Click the **Transition Properties** button ( ) on the transition or right-click the transition and choose **Transition Properties** from the shortcut menu. The Video Event FX window appears.
2. Change the parameters. Changes update in real time in the Video Preview window. For help on the different controls in the Video FX window, click the **Plug-In Help** button ( ) to access online help.



### Saving custom settings as a preset

After you modify a transition, you can save your settings as a preset for use at a later time. You can apply presets by choosing them from the **Preset** drop-down list.

1. Modify the settings in the window to create your desired transition effect. For help on the different controls in the window, click the **Plug-In Help** button ( ) to access online help.
2. Click the name in the **Preset** drop-down list. The current text is highlighted.
3. Enter a name for the new preset.
4. Click the **Save Preset** button ( ).

You can save any additional changes to the custom preset by clicking the **Save Preset** button.

## Using keyframe animation

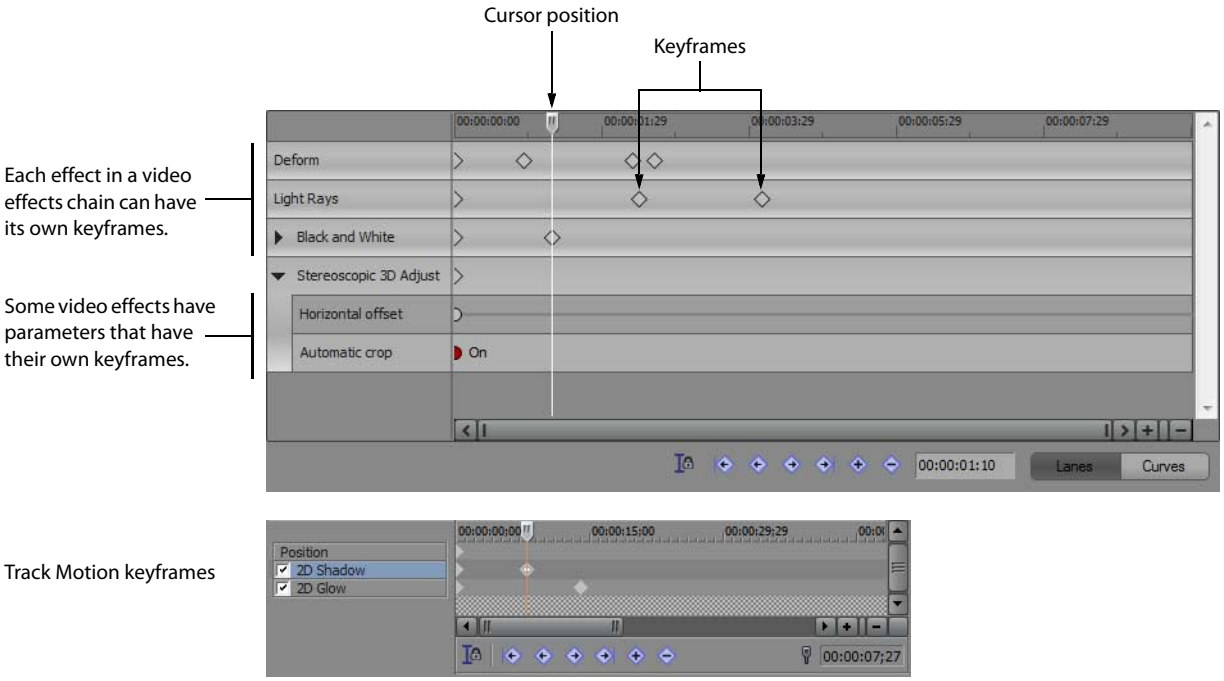
Keyframe animation is a technique that computer artists use to quickly make complex animated sequences. Instead of drawing every frame of a title scrolling in from top to bottom by hand, an animator simply has to set a starting and ending position for the animation and let the computer interpolate the intermediate frames. The animation pictured on the right has three keyframes: a starting, middle, and ending keyframe. More complex animations use more keyframes.

While keyframing motion may be the most obvious use for keyframe animations, just about any parameter of an effect can be animated with keyframes. Keyframe animation techniques are used in many areas, including transition effects, video effects, event panning and cropping, generated media, and track motion. You can animate color, brightness, transparency, motion, size, perspective, and many other parameters with keyframes.

These three frames show the progression of a title across three keyframes.

### Understanding the keyframe controller

The keyframe controller appears at the bottom of the Video FX window (used for transitions, effects, and generated media), the Track Motion window, and the Pan/Crop plug-in.




| | |
|---|---|
| **Sync Cursor** Sync the keyframe cursor with the timeline cursor. | **Last Keyframe** Go to the last keyframe. |
| **First Keyframe** Go to the first keyframe | **Create Keyframe** Create a keyframe at the cursor position. |
| **Previous Keyframe** Go to the previous keyframe. | **Delete Keyframe** Delete the selected keyframe. |
| **Next Keyframe** Go to the next keyframe. | |

The cursor position is marked by a flashing line on the controller. This position can also be automatically updated on the timeline, with the Video Preview window also updating in real time to reflect changes. Click the **Sync Cursor** button ( ) on the keyframe controller to sync the keyframe cursor with the timeline cursor.

### Adding keyframes

Every effect has a starting keyframe at the beginning (left side) of the keyframe controller. This sets the initial parameters for the effect. In order to animate the effect, you must add another keyframe to the effect and change some of the parameters. When you first add a new keyframe, it has the same settings (for the transition, effect, pan/crop, etc.) as the first keyframe. You can then modify the settings of the new keyframe to create the animation from the first keyframe settings to the second.

1. Click the keyframe controller timeline to move the cursor where you want to add a keyframe. The current position is marked by a blinking cursor.
2. Click the **Create Keyframe** button ( ).
3. Modify the settings in the window for the new keyframe as desired.

**Tip:** *You can also add a new keyframe by positioning the cursor in the keyframe controller and changing any parameters in the window. A keyframe is added with the new settings at the cursor position.*

### Deleting keyframes

1. Select a keyframe in the keyframe controller.
2. Click the **Delete Keyframe** button ( ).

### Navigating in the keyframe controller

Use the keyframe navigation buttons (**First**, **Previous**, **Next**, and **Last**) to quickly jump to a keyframe. Alternately, press Ctrl+Left Arrow or Ctrl+Right Arrow to move to the previous or next keyframe.

### Modifying keyframes

After you create your keyframes, you can move them, copy and paste them, and change the interpolation curves between them.

#### Moving keyframes

You can move a keyframe within the keyframe controller by dragging it to a new position. For track-level keyframes, you can also move the keyframes in the timeline. *For more information, see Working with keyframes in the timeline on page 334.*

#### Copying and pasting keyframes

Keyframes on the controller can be copied, pasted, and duplicated.

1. Right-click a keyframe.
2. From the shortcut menu, choose **Copy**.
3. Right-click the keyframe controller at the position where you want to paste the keyframe.
4. From the shortcut menu, choose **Paste**.

#### Duplicating keyframes

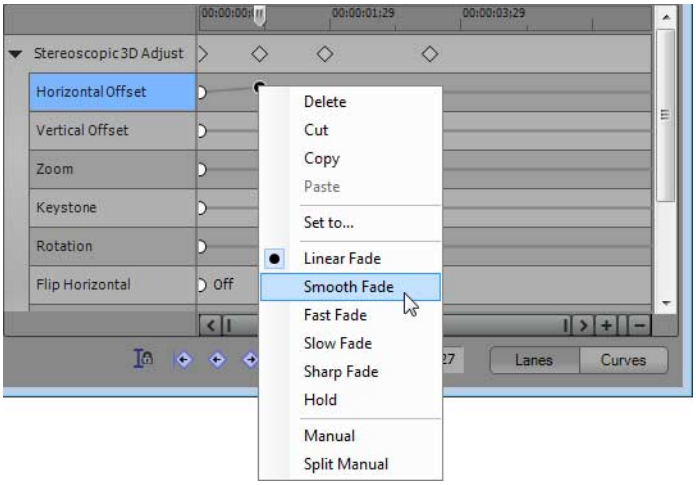
1. Right-click and drag a keyframe to a new position.
2. From the shortcut menu, choose **Copy**. A duplicate keyframe is created at the new position.

You can also duplicate a keyframe by holding the Ctrl key while dragging it.

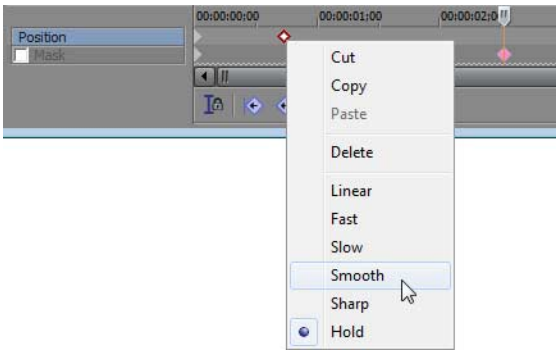
#### Changing the interpolation curve

The interpolation curve determines the rate at which Vegas Pro software animates between two keyframe settings. You can right-click a keyframe to choose a different shape for the interpolation curve. The shortcut menu provides six options: **Linear**, **Smooth, Fast**, **Slow**, **Sharp,** and **Hold**. Selecting **Hold** from the shortcut menu prevents any animation from being interpolated between two keyframes.

For event pan/crop and video effects, the line between keyframes indicates which interpolation curve is being used.




For track motion keyframes, the color of the keyframe indicates which interpolation curve is being used.

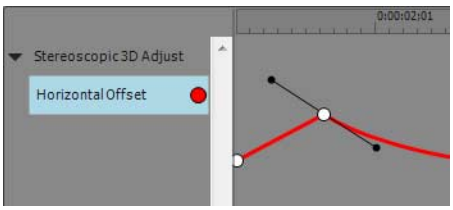



- Linear (gray)
- Fast (green)
- Slow (gold)
- Smooth (lilac)
- Sharp (pink)
- Hold (red)

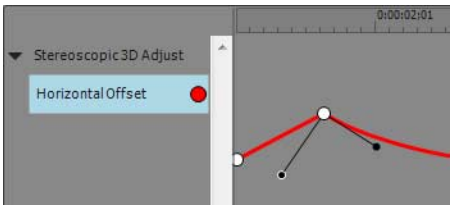
In the Curves view of the event pan/crop and video effects keyframe controller, you can manually adjust a keyframe's spline curves. Click the **Lanes** and **Curves** buttons to toggle between the Lanes and Curves views.

**Note:** *The Curves view is not available for event pan/crop and track motion keyframes.*

Right-click a keyframe and choose **Manual** from the shortcut menu to display the spline curve handles. Drag the handles to adjust the curve.




Right-click a keyframe and choose **Split Manual** from the shortcut menu to independently adjust the curve on each side of the keyframe.



### Changing the relative spacing of keyframes

You can change the relative positions of the keyframes as a group. This can be useful if you need to change the overall length of an animated sequence or if you need to copy a set of keyframes to another event that has a different duration than the original.

1. Click on the first keyframe, hold the Shift key, and click on the last keyframe in the sequence to select all of the keyframes.
2. Hold Alt and drag the first or last keyframe to scale the keyframes.

When copying keyframes from longer events to shorter events, you must temporarily lengthen the duration of the shorter event so that all of the keyframes appear on the keyframe controller. Once you have pasted the keyframes, you can rescale the keyframes using the above procedure, and then resize the event to its original length.

## Creating keyframe presets

The 2D and 3D track motion dialogs allow you to create, save, and recall keyframe presets. Keyframe presets save the settings of the selected keyframe row at the cursor position.

**Notes:**

- *Presets for the Position, 2D Shadow, and 2D Glow keyframe rows are saved separately.*
- *Presets for 2D and 3D track motion are saved separately. Presets you create in the 2D Track Motion window will not be available in the 3D Track Motion window.*

### Saving a preset

1. Adjust your **Position**, **2D Shadow**, or **2D Glow** settings as desired to create a keyframe.
2. Type a name in the **Preset** box.
3. Click the **Save Preset** button ( ).

**Notes:**

- *Presets for the Position, 2D Shadow, and 2D Glow keyframe rows are saved separately.*
- *Presets for 2D and 3D track motion are saved separately: presets you create in the 2D Track Motion window will not be available in the 3D Track Motion window.*

### Recalling a preset

1. Click in the **Position**, **2D Shadow**, and **2D Glow** keyframe row to select a row and position the cursor where you want to apply the preset.
2. Choose a setting from the **Preset** drop-down list.

   If no keyframe exists at the cursor position, one is created using the settings from the preset. If a keyframe exists at the cursor position, the keyframe's settings are replaced with the settings from the preset.

### Deleting a preset

Click the **Delete Preset** button ( ) to delete the current preset.

## Working with keyframes in the timeline

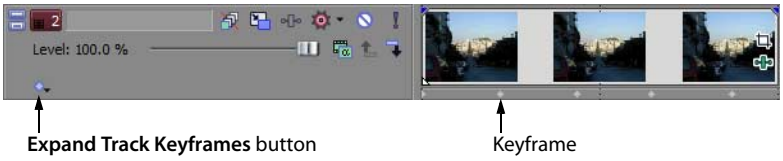
You can move and modify track keyframes in the timeline. These keyframes are used in the following three track-level effects:

- Track effects plug-in (*For more information, see Applying video effects on page 301.*)
- Track motion (*For more information, see Adding track motion on page 339.*)
- Mask generator plug-in on a parent compositing track (*For more information, see Using the Mask Generator on page 319.*)

### Viewing and moving track keyframes

Once you have added keyframes to one of these track-level effects, the track keyframes appear at the bottom of the track on the timeline. Click the **Expand Track Keyframes** button ( ) to view the keyframes.

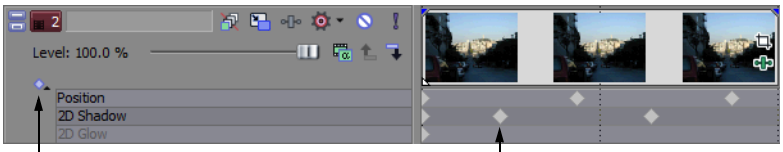
You can drag a keyframe on the track in the same way you would in the keyframe controller. To move several keyframes at once, use the **Envelope Edit** tool ( ) to select and drag multiple keyframes.




**Expand Track Keyframes** button

Keyframe

With track keyframes collapsed, keyframes are minimized.




**Collapse Track Keyframes** button

Keyframe

With track keyframes expanded, each set of keyframes is displayed. You can move any keyframe by dragging it to a new position.

**Tip:** *You can use ripple editing to automatically move track keyframes as you edit in the timeline. For more information, see* *Applying post-edit ripples on page 87*.

### Adding new track keyframes

You can add new track keyframes to an existing track-level effect by double-clicking the track keyframe area.

### Editing track keyframes

Double-click a track keyframe to open the associated window and adjust the settings. To change a keyframe interpolation curve, right-click the keyframe and choose a curve type from the shortcut menu.

### Locking track keyframes to events

When track keyframes are locked, you can move events along the track and the keyframes move along with them. Only keyframes that occur within the selected events move.

Select the **Lock Envelopes to Events** button ( ) to lock track keyframes to the events on the track.

### Hiding track keyframes

If the timeline becomes too cluttered, you can hide track keyframes from view. From the **View** menu, choose **Show Video Envelopes**, and choose **Track Keyframes** from the submenu to hide track keyframes.

## Sample uses for keyframe animation

The following section provides several examples of how keyframe animation can be used with features such as event panning and cropping, video effects plug-ins, and generated text events.

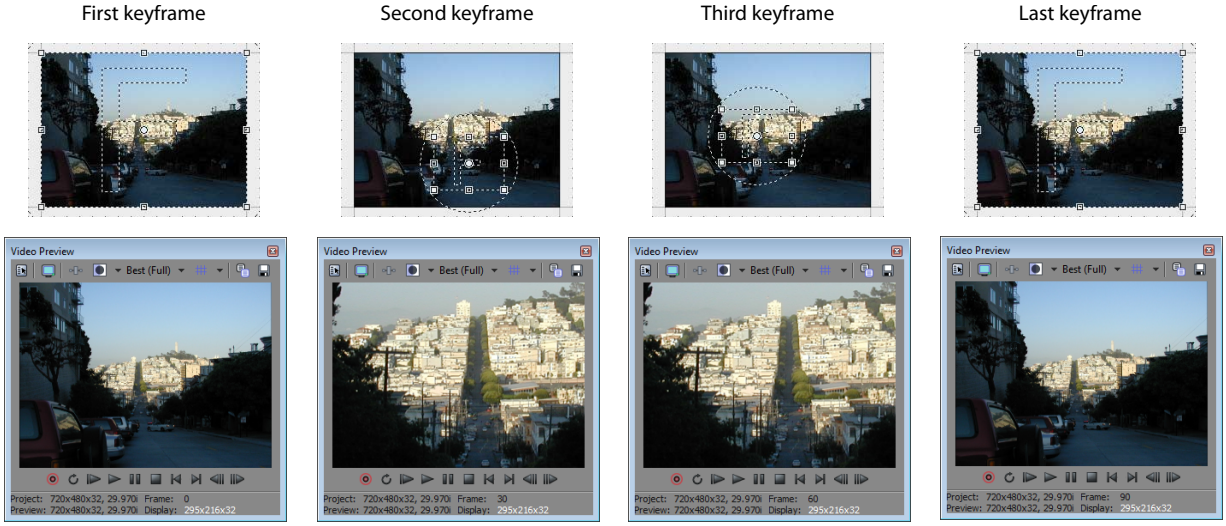
### Animating event panning and cropping

You can combine event panning and cropping tools with keyframe animation to create several special effects. *For more information, see Cropping or zooming a video event on page 264.*

#### Zooming in on a still image

By using keyframe animation in the Pan/Crop plug-in, you can zoom in and out on a still image. In this example, four keyframes are used to zoom in on a street scene in a photograph and zoom back out again. A generated color gradient event masks the edges of the image during the zoom to enhance the effect. *For more information, see Using generated media on page 305.*

1. Click the **Event Pan/Crop** button ( ) on the still image event.
2. Click the keyframe controller to position the cursor for the second keyframe.
3. Click the **Add Keyframe** button ( ). Resize and move the selection area to zoom in on a portion of the image.
4. Click the keyframe controller to position the cursor for the third keyframe.
5. Click the **Add Keyframe** button ( ). Resize and move the selection area to zoom in on a different portion of the image.
6. Click in the keyframe controller near the end of the event to place the final keyframe.
7. Click the **Add Keyframe** button ( ).
8. Right-click in the selection area and choose **Restore** from the shortcut menu. The selection area is zoomed out to include the full image for the last keyframe.
9. Preview the event in the Video Preview window. Adjust the settings in the Pan/Crop plug-in as you preview the zoom effect.



### Using pan-and-scan

Another way to use keyframe animation in the Pan/Crop plug-in is panning, or pan-and-scan. Pan-and-scan is a technique commonly used when film is converted for television. Movie screens and film are usually wider (~2.35:1) than television (~1.33:1). When you transfer the film to video, you have four choices: (1) squash the film horizontally to fit, distorting it in the process; (2) crop it, possibly losing information on the sides; (3) letter box it so the top and bottom have black areas and the picture is shorter overall; and (4) pan-and-scan. Pan-and-scan is a variation of cropping, where someone goes through the movie and moves the crop area back and forth to follow the action or subject.

1. Click the **Event Pan/Crop** button ( ) on the event. The Pan/Crop plug-in is displayed in the Video FX window.
2. Confirm that the **Stretch to fill frame** check box is selected.
3. Right-click the selection area and choose **Match Output Aspect** from the shortcut menu.
4. Select a starting position, size, and angle of rotation for the crop rectangle. This is the start position (first keyframe).
5. Click in the keyframe controller and press Ctrl+End. This moves the cursor to the end of the event.
6. Click the **Create Keyframe** button ( ). A new keyframe appears in the keyframe controller at the end of the event.
7. Change the position, size, and angle of rotation. This is the final position (last keyframe).
8. Preview the event. Add and adjust keyframes as needed to create the desired effect. You can adjust both temporal and spatial interpolation for each keyframe:
   - **Temporal interpolation** (how the pan occurs over time) is controlled by the keyframe interpolation curve type. Experiment with temporal interpolation by right-clicking a keyframe to change the interpolation curve type (hold, linear, fast, slow, smooth) and previewing the result. *For more information, see Changing the interpolation curve on page 332.*
   - **Spatial interpolation** (how the pan occurs within the video image) is controlled by the **Smoothness** setting of each keyframe. A smoothness value of 0 makes the movement linear from one keyframe to the next. A higher smoothness value makes the path of the pan more curved. Select a keyframe and change the **Smoothness** value to adjust spatial interpolation.

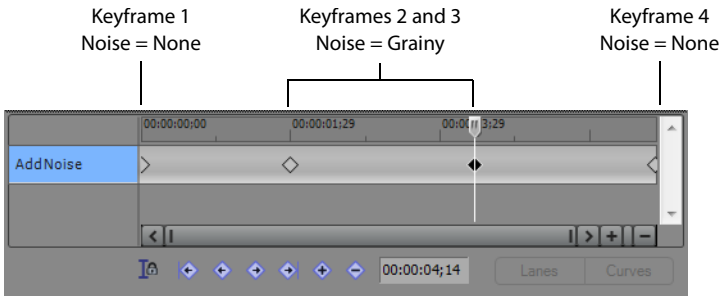
## Animating video effects plug-ins

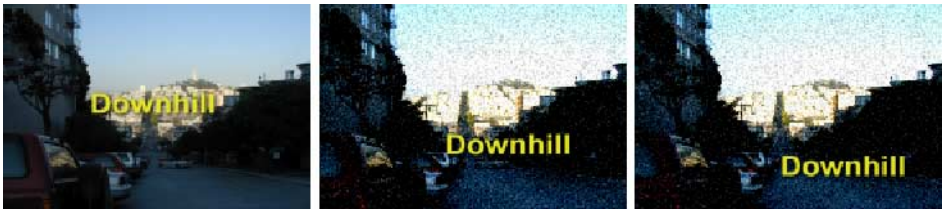
You can use keyframe animation to smoothly and gradually apply an effect to an event. This example uses the Add Noise plug-in. The Add Noise plug-in adds static or noise to a video sequence. When added to a simple solid-colored background with a monochrome setting and animated, a pattern is produced that is similar to a television that is not tuned to any station.

1. Add an Add Noise plug-in to an event. *For more information, see Applying video effects on page 301.*

   The Video FX window is displayed.
2. Click the **Animate** button to display the keyframe controller at the bottom of the window.
3. Add two keyframes to the event for a total of three including the one at the beginning. New keyframe attributes are copied from the previous keyframe.
4. Click the first keyframe to select it. Drag the **Noise level** slider to 0.
5. Click the last keyframe to select it. Drag the **Noise level** slider to 0.
6. Click the second keyframe to select it. From the **Preset** drop-down list, select **Grainy**.
7. Hold Ctrl and drag the second keyframe to duplicate it. Position this new keyframe between the second and final keyframes.

   The effect is off at the first keyframe and smoothly transitions to a grainy effect at the second keyframe, at which point the effect remains constant until the third keyframe. Then the effect gradually fades out until it reaches a minimum value at the last keyframe.






The results of gradually transitioning into an effect using keyframe animation.

### Animating generated text

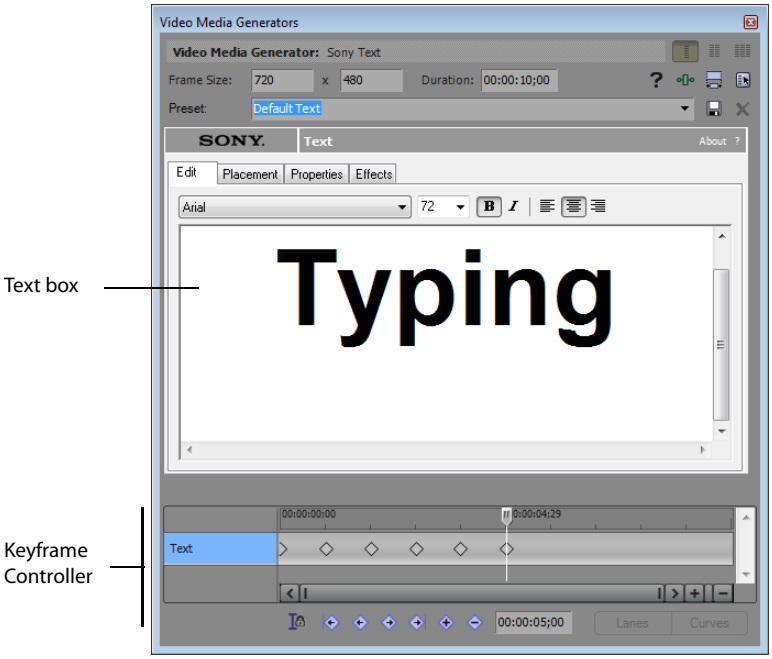
You can add a generated text event to a project by dragging a text generator from the Media Generator window. *For more information, see Using generated media on page 305*. You can then animate the text by adding keyframes.

Not all attributes of generated text media can be animated using keyframes, however. You cannot, for example, morph one text message into a different one. Some aspects can be easily and smoothly animated using the keyframe controller, such as text, color, transparency, leading, tracking, and position.

Other aspects of generated text do not allow interpolated keyframe animation. For example, if you set the text to "One" initially and then at five seconds change it to "Two", the text will suddenly jump to the new value at the five second keyframe. This behavior is different from the behavior of other keyframe animation techniques.

In this example, keyframes are used to make a title appear one letter at a time across the screen.

1. Drag a text generator from the Media Generator window to the timeline.
2. Right-click the new event and choose **Edit Generated Media**.
3. Type the first letter of the title, for example "T".
4. Click the keyframe controller at the 1.000 second mark and type the second letter, for example "y". The title now reads "Ty". A new keyframe appears in the keyframe controller at the 1.000 second mark.
5. Proceed down the keyframe controller to 2.000 and type the letter "p".
6. Proceed down the keyframe controller repeating this process until the title is finished: "Typing".
7. Preview the event in the Video Preview window. The word "Typing" appears one letter per second until finished.



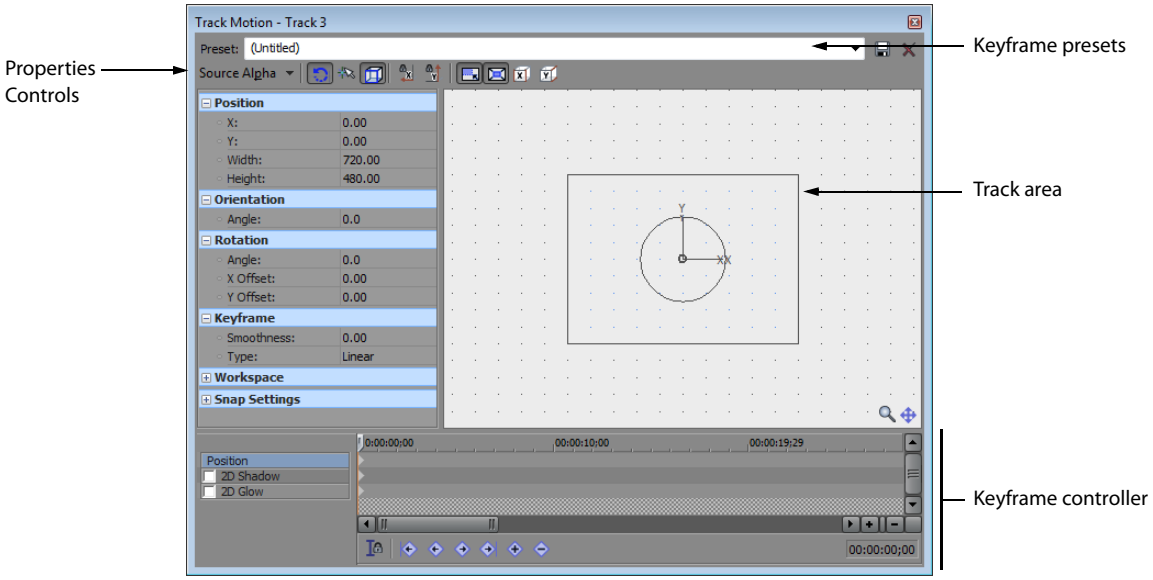
## Adding track motion

The Track Motion window (accessible by clicking the **Track Motion** button ( ) on any video track) is used to move a video track across a background. This background can be a solid color, another video event, or an image. Picture-in-picture effects and scrolling title sequences are two simple cases where this tool is important.

The gray area in the center of the window (covered by the blue/gray rectangle) represents the actual screen or area that is visible in the movie. The area outside of the main screen, which is filled with dotted lines, is the general workspace. The video you are moving can be positioned off of the visible screen and then animated onto and across the screen. The dots are markers to help position the video window. If snapping is enabled, these serve as snapping points.

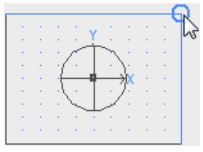
The main window allows you to control the placement, size, and orientation of the overlay video through time. The blue and gray rectangular overlay in the middle represents the video on the track. The selection box in the workspace is used to represent the orientation of the track.

You can also use 3D compositing to move tracks through space. *For more information, see 3D compositing on page 310.*

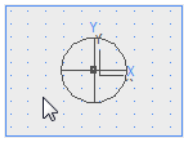



### Controlling track motion

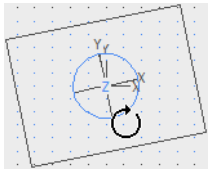
1. Click the **Track Motion** button ( ) on the track that contains the overlay that you want to animate. The Track Motion window is displayed.
2. Adjust the selection area to change the viewable area of the track and its position in space. Guides are displayed in bold to indicate how the track will be moved or rotated:



Moving closer to or farther from viewer. Drag across corners to flip the track.



Dragging the track.



Rotating around the Z axis.

3. Use the buttons at the top of the dialog to allow or prevent movement or scaling. *For more information, see Changing editing options on page 340.*
4. The track motion occurs instantly, and the results are updated in the Video Preview window.

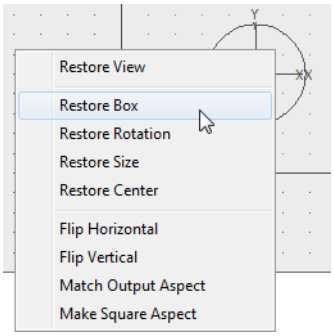
5. Use the keyframe controller at the bottom of the Track Motion window to establish distinct track motion settings throughout the duration of the track.

   During playback, immediate frames are interpolated to create smooth motion. Expand the **Keyframe interpolation** heading on the left side of the window and drag the **Smoothness** slider to adjust the interpolation. *For more information, see Using keyframe animation on page 330.*

**Tip:** *Use the* **Track Motion default smoothness** *control on the External Control & Automation tab of the Preferences window to set the default* **Smoothness** *value for new keyframes. For more information, see External Control & Automation tab on page 430.*

### Using the track motion shortcut menu

When you right-click anywhere in the Track Motion window, a shortcut menu appears:




- **Restore View** returns the workspace display to its original state.
- **Restore Box** returns the overlay to its original state (size, rotation, and position).
- **Restore Rotation** returns the overlay to its unrotated state.
- **Restore Size** returns the overlay to its original size.
- **Restore Center** moves the overlay to the center of the frame.
- **Flip Horizontal** flips the overlay backwards or left to right.
- **Flip Vertical** flips the overlay upside-down.
- **Match Output Aspect** sets the aspect ratio to the frame value.
- **Make Square Aspect** sets selection box to a square aspect.

### Changing editing options

Use the toolbar at the top of the Track Motion window to change your editing options.

| Icon | Command | Description |
|---|---|---|
| | **Enable Rotation** | Select this button if you want to be able to rotate, or spin, the video.<br>When the button is not selected, video is locked so you can move it horizontally or vertically, but the track cannot be rotated. |
| | **Enable Snapping to Grid** | Select this button if you want your editing to snap to the grid. |
| | **Edit in Object Space** | Select this button if you want to edit in the object's space rather than the camera's space.<br>For example, if a track is rotated, its X axis may not correspond to the X axis of the of the Video Preview window. Selecting the **Edit in Object Space** button in conjunction with the **Prevent Movement** buttons allows you to move the object along its own X and Y axes. |
| | **Prevent Movement (X)** | Select this button if you want to prevent horizontal movement of the track. |
| | **Prevent Movement (Y)** | Select this button if you want to prevent vertical movement of the track. |
| | **Lock Aspect Ratio** | Select this button if you want the selection box to retain its aspect ratio during resizing.<br>When the button is not selected, the height and width can be resized independently. |

| Icon | Command | Description |
|---|---|---|
| | **Scale About Center** | Select this button if you want the selection box to retain its center point when you resize the box by dragging its edges.<br>When the button is not selected, the opposite side of the selection box will remain anchored when you drag the edges to resize it. |
| | **Prevent Scaling (X)** | Select this button if you want to lock the horizontal dimension of the selection box. |
| | **Prevent Scaling (Y)** | Select this button if you want to lock the vertical dimension of the selection box. |

## Using keyframes in track motion

Keyframes are what create the motion in the track motion feature. You can create, modify, and remove keyframes in the keyframe controller in the same way as with any other feature that uses keyframes. In addition, for track motion and 3-D track motion, you can use keyframe presets to save and recall the settings of the selected keyframe row at the cursor position. *For more information, see Using keyframe animation on page 330.*

The keyframe controller in the Track Motion window has three attributes that can be animated: position, shadow, and glow. Each effect can be animated independently. The shadow and glow effects can be turned on and off. Each effect has its own set of controls that appear on the left-hand side of the window. You can access these controls by clicking the respective item on the keyframe controller.

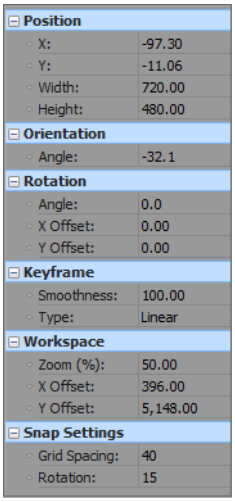
**Tip:** *If any controls described in this section are not visible on the screen, enlarge the Track Motion window by dragging the lower right corner until all controls are revealed.*

### Position

You can control the position of the overlay in the main window by dragging the selection box or editing the controls on the left side of the window. However, the **Position**, **Orientation**, and **Rotation** controls in the window are invaluable when you need precision in resizing, moving, or rotating the overlay.

The **Smoothness** box allows you to modify the smoothness of the interpolation curve among three or more keyframes.

You can use the **Workspace** controls to adjust the magnification and viewable area of the workspace. Use the **Snap Settings** controls to adjust the grid in the workspace.



### 2D Shadow

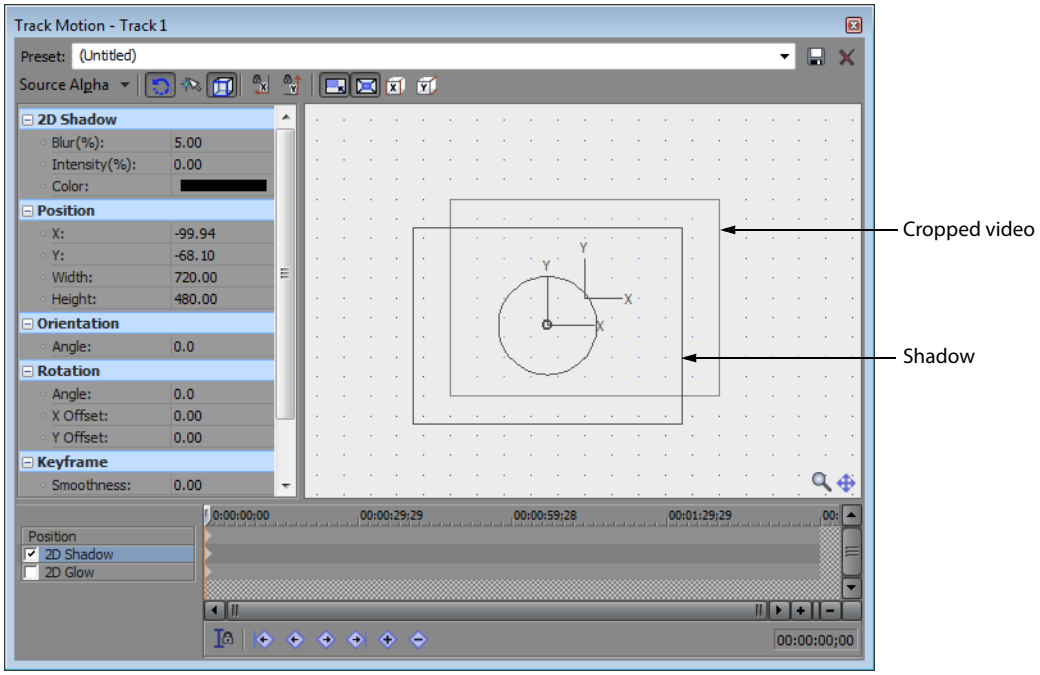
This creates a simple drop shadow that appears under the entire window or only under the opaque (nontransparent) parts of the overlay. You can control the size and offset of the shadow as well as the shadow color. A shadow is especially effective under a picture-in-picture window or to emphasize text and titles. Use the **Eyedropper** tool to select a specific color from anywhere on the screen.

The shadow effect creates a drop shadow under an object, window, or title. A shadow is especially effective under a picture-in-picture window.

1. Select the **2D Shadow** row in the keyframe controller. When the **2D Shadow** row is selected, shadow controls are displayed in the Track Motion dialog.

   Select the **2D Shadow** check box to apply the shadow so you can see the results of your shadow in the Video Preview window, or clear the check box to bypass the shadow.

2. Use the **2D Shadow** controls on the left side of the window to set the color and appearance of the shadow:
   - **Blur** Type a number in the box or click the down arrow button ( ) to display a slider you can use to soften the edge of the shadow. Set to 0 for a hard edge, or increase the setting to feather the edge of the shadow.
   - **Intensity** Type a number in the box or click the down arrow button ( ) to display a slider you can use to establish the transparency of the shadow's blurred edge. Decrease the setting for a translucent shadow, or increase the setting for a more opaque shadow.
   - **Color** Click the down arrow next to the color swatch to display a color picker. Use the sliders or edit boxes in the color picker to set the shadow color, or use the **Pick Color from Screen** tool ( ) to sample a color from your screen.
3. Adjust the size position of the shadow by dragging the box in the workspace or using the **Position**, **Orientation**, and **Rotation** controls on the left side of the window. *For more information about manipulating the selection box, see* *Controlling track motion on page 339*.



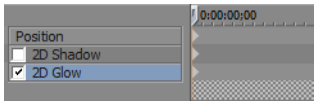

4. To animate the shadow, click in the **2D Shadow** row of the Keyframe Controller to set the cursor to a later time and adjust the shadow settings.

### 2D Glow

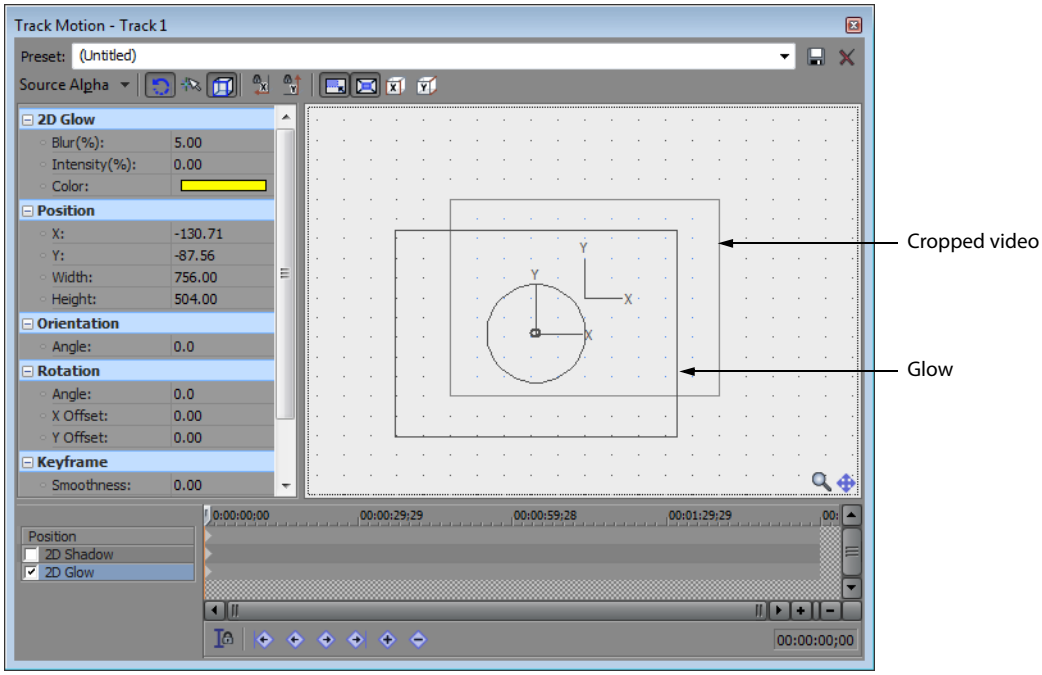
Glow is a bright haze surrounding an overlay. In general, light colors are used for glow effects, but you can emphasize bright text on complex backgrounds by using a very small black glow, with little or no feathering, and 100% intensity.

1. Select the **2D Glow** row in the keyframe controller. When the **2D Glow** row is selected, glow controls are displayed in the Track Motion dialog.

   Select the **2D Glow** check box to apply the glow so you can see the results of your shadow in the Video Preview window, or clear the check box to bypass the glow.




2. Use the **2D Glow** controls on the left side of the window to set the color and appearance of the glow:
   - **Blur** Type a number in the box or click the down arrow button () to display a slider you can use to soften the edge of the glow effect. Set to 0 for a hard edge, or increase the setting to feather the edge of the glow.
   - **Intensity** Type a number in the box or click the down arrow button () to display a slider you can use to establish the transparency of the glow's blurred edge. Decrease the setting for a translucent glow, or increase the setting for a more opaque glow.
   - **Color** Click the down arrow next to the color swatch to display a color picker. Use the sliders or edit boxes in the color picker to set the glow color, or use the **Pick Color from Screen** tool () to sample a color from your screen.
3. Adjust the size position of the glow by dragging the box in the workspace or using the **Position**, **Orientation**, and **Rotation** controls on the left side of the window. *For more information about manipulating the selection box, see Controlling track motion on page 339.*



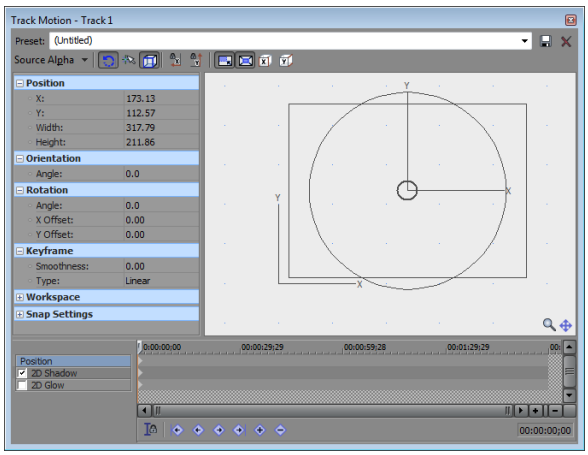

4. To animate the glow, click in the **2D Glow** row of the Keyframe Controller to set the cursor to a later time and adjust the glow settings.

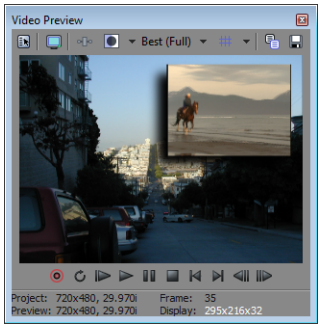
## Creating a picture-in-picture effect

Picture-in-picture is an easy effect to reproduce using track motion.

1. Insert the background video into a track.
2. Insert the overlay video into another track just above the background video track.
3. Click the **Track Motion** button () on the upper overlay track.
4. In the Track Motion window, position and resize the track area.

The illustration below shows some of the relevant parts of this procedure. Note the shadow cast by the overlay video. This is added by selecting the **2D Shadow** check box on the keyframe controller. The Video Preview window displays the results.






**Tip:** *While overlay picture-in-picture windows are often completely opaque, you can fade them in and out using opacity envelopes. For more information, see Using opacity envelopes on page 186.*

### Animating the overlay

You can animate many aspects of an overlay using the keyframes at the bottom of the Track Motion window.

1. Insert a video event onto the timeline.
2. Click the **Track Motion** button ( ) in the track list.
3. In the Track Motion window, resize the overlay by dragging the handles at the edges of the overlay.
4. Drag the middle of the overlay to position it. This will be the size and position for the start of the animation.
5. Click the timeline of the keyframe controller at a later time to move the cursor to that position.

**Tip:** *With the* **Sync Cursor** *button ( ) enabled, you can also navigate to a new position on the main timeline. The cursor is automatically moved on the keyframe controller to the same location.*

6. Reposition the overlay. A new keyframe is automatically added to the keyframe controller at the new cursor position.

   When you preview the video, the position of the overlay interpolates between the two keyframes with a smooth animation.

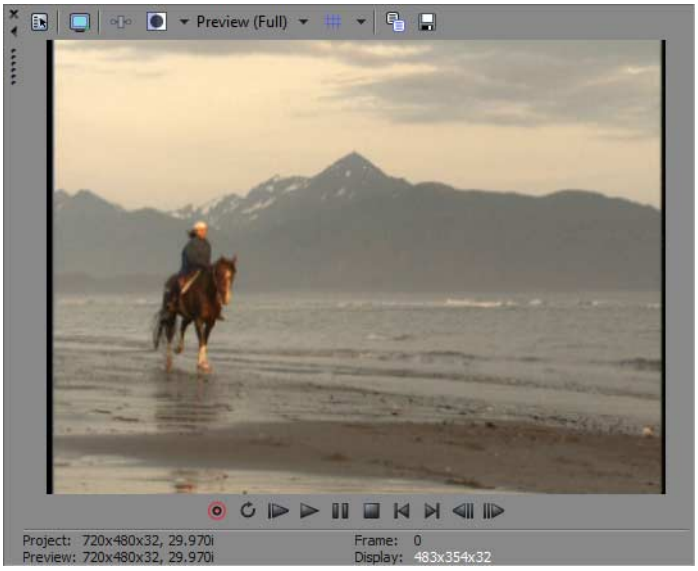
Chapter 19

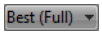
# Previewing and Analyzing Video

As you work in Vegas® Pro software, you can preview your video by using the Video Preview window or by connecting to an external monitor. You can optimize previews by adjusting preview quality, prerendering video, or building a dynamic RAM preview. The Video Preview window also provides features such as safe area overlays, grid overlays, and isolated color channel displays to further enhance your productivity.

## Understanding the Video Preview window

The workspace for editing video can get quite crowded, so the Video Preview window can be configured in a number of ways to make it more useful. The Video Preview window can be used on a separate monitor or Windows display (if your video hardware supports this feature), docked at the bottom of the workspace, or floated freely on the screen.




| Button | | Description |
|---|---|---|
| | **Project Video Properties** | Displays the project's properties. *For more information, see Modifying project video properties on page 282.* |
| | **Preview on External Monitor** | Sends the preview out to an external monitor. This only functions if your hardware supports this feature. *For more information, see Preview Device tab on page 417.* |
| | **Video Output FX** | Opens the Video Output FX window for adding video effects plug-ins for the entire project. *For more information, see Applying video effects on page 301.* |
| | **Split Screen View** | Turns split-screen previews on or off. Split-screen previews allow you to split the preview window so you can see your affected and unaffected video or your video and the contents of your clipboard at the same time. |
|  | **Preview Quality** | Changes the preview resolution and display size. You can choose a lower resolution to drop fewer frames during playback. Choose an **Auto** option to display the preview at the current Video Preview window size; choose a **Full** option to display the preview at project size.<br><br>**Note:** *If your project properties are set to either the* **Blend** *or* **Interpolate deinterlace** *method, you will not see the effects of deinterlacing in* **Draft** *and* **Preview quality** *preview modes. Deinterlacing only occurs in the* **Good** *and* **Best** *quality preview modes.* |
| | **Overlays** | Options include safe areas, grids, closed captions, and individual channels. |

| Button | | Description |
|---|---|---|
| | **Copy Snapshot to Clipboard** | Copies the current frame to the clipboard.<br>You can change the size of the image using the **Preview Quality** button. Choose **Auto** or **Full** to capture the frame at its full resolution, or choose **Half** or **Quarter** to capture a smaller image. |
| | **Save Snapshot to File** | Saves the current frame as an image file.<br>You can change the size of the image using the **Preview Quality** button. Choose **Auto** or **Full** to capture the frame at its full resolution, or choose **Half** or **Quarter** to capture a smaller image.<br>The Save Snapshot to File dialog is displayed to allow you to choose the format and location where you want to save the file. The file is automatically added to the Project Media window.<br>*For more information, see Capturing a timeline snapshot on page 272.* |

The Video Preview window also displays a transport bar similar to the transport bar on below the project timeline. *For more information, see Transport bar controls on page 24.*

### Using the Video Preview window shortcut menu

Right-click the Video Preview window to adjust the following options.

| Item | Description |
|---|---|
| **Default Background** | Sets the background color for the window. |
| **Black Background** | |
| **White Background** | |
| **Simulate Device Aspect Ratio** | Displays the output in square pixels. This can prevent distortion of the preview when using sources with rectangular pixels. This does not affect the final render. |
| **Scale Video to Fit Preview Window** | Scales the video to fill the Video Preview window. This setting is used for previewing only. |
| **Adjust Size and Quality for Optimal Playback** | Emphasizes frame rate during playback. When this option is not selected, video quality is emphasized, and the frame rate will be reduced if necessary. |
| **Show Toolbar** | Toggles the toolbar at the top of the window. |
| **Show Status Bar** | Toggles the information display at the bottom of the window. |
| **Show Transport Bar** | Toggles the transport bar at the bottom of the window. |
| **Video Preview Preferences** | Displays the Video tab of the Preferences dialog, allowing you to configure video preview settings. |
| **Preview Device Preferences** | Displays the Preview Device tab of the Preferences dialog, allowing you to configure an external monitor. |

## Optimizing the Video Preview window

Timing and synchronization are critical aspects of any multimedia production. Because complex multimedia projects are challenging for any computer, a number of tools are provided to maintain real-time playback even though the computer may not be able to process the data quickly enough.

**Note:** *If you want to emphasize frame rate during preview, right-click in the Video Preview window and select* **Adjust Size and Quality for Optimal Playback** *from the shortcut menu. When this option is not selected, video quality is emphasized, and the frame rate will be reduced if necessary.*

### Adjusting preview quality and resolution

You can adjust the resolution of the Video Preview window and the quality of the preview rendering in order to improve playback. Lower-resolution previews are less clear but allow more frames to be displayed per second. This may be particularly important with projects that use overlays, transitions, and effects. Click the **Preview Quality** button and choose a setting from the menu to change the quality and resolution for rendering your video preview.

The **Auto** setting will adjust the frame size to fit the Video Preview window size. The **Full** setting processes frames at the project frame size. The **Half** setting processes frames at half the project frame size. The **Quarter** setting processes frames at one-quarter of the project's frame size. For example, if you have an NTSC (720x480) project, **Half** creates a 360x240 preview; **Quarter** creates a 180x120 preview.

**Tip:** *Choosing a* **Quarter** *or* **Half** *setting can improve playback performance when previewing high-definition source material.*

If you want to display square pixels in the Video Preview window even if the **Pixel aspect ratio** setting in the Project Properties dialog is using nonsquare pixels (DV), right-click the display and choose **Simulate Device Aspect Ratio** from the shortcut menu.

If you want the preview to fill the Video Preview window, right-click the display and choose **Scale Video to Fit Preview Window** from the shortcut menu.

**Tip:** *Try setting the preview quality to* **Preview** > **Full** *and enabling* **Scale Video to Fit Preview Window**.

This setting is used for previewing only and has no effect on the final rendered video. Decreasing the preview resolution can allow the Vegas Pro Video Preview window to display a higher frame rate, especially for complex projects that contain overlays, transitions, and effects.

**Note:** *To view the effects of the deinterlacing method you chose in your project properties, you will need to use the* **Good** *or* **Best** *quality preview mode. The* **Draft** *and* **Preview** *quality preview modes do not deinterlace.*

### Prerendering video

There are times where nothing but a full, high-quality preview will do. In these cases, Vegas Pro software can take the time necessary to selectively render only the portions of your project that need extra processing. These sections are prerendered and short files are created to use for previews. The prerendering can take anywhere from a few seconds to a few minutes, depending on the length and complexity of the video.

Once these temporary files have been created, they are used whenever those sections of the project are played back, increasing playback quality and performance. As long as no changes are made to the events in the prerendered sections, the newly created files continue to be used for previews, even if changes are made to other sections of the project.

1. To prerender a portion of the project, create a selection containing the portion you want to prerender.
2. From the **Tools** menu, choose **Selectively Prerender Video**. The Prerender Video dialog appears.
3. Select the type of prerender file to create in the **Prerender as** drop-down list. Click **Custom** to configure any custom compression options.

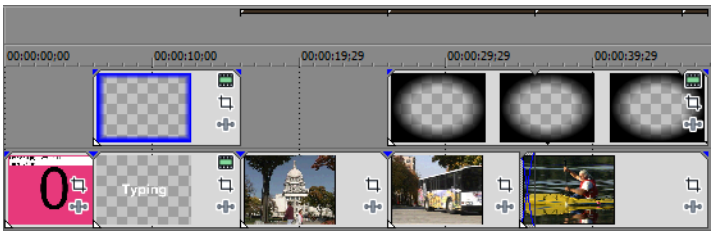
**Notes:**

- *You'll need to choose a rendering template that inserts pulldown fields to create a standard DV file if your project properties are set to 24p or if you selected the* **Allow pulldown removal when opening 24p DV** *check box on the* **General** *tab of the Preferences dialog. Use the* **NTSC DV 24p (inserting 2-3-3-2 pulldown)** *template if you intend to use the file on the Vegas Pro timeline.*
- *If you cleared the* **Allow pulldown removal when opening 24p DV** *check box before adding your media and your project properties are not set to 24p, your 24p video is read as 29.97 fps interlaced video (60i), so you can choose whichever NTSC DV or PAL DV template suits your project requirements.*

4. To preview just a portion of the project, verify that **Render loop region only** is selected. To create a prerender of the entire project, clear this check box.
5. Select the **Stretch video to fill output frame size (do not letterbox)** check box when you are rendering to an output format with a slightly different aspect ratio than your project settings. This will prevent black bars from appearing on the top and bottom or the sides of the output.
6. Click **OK**. A progress bar displays the progress of the render.

When prerendering is complete, bars appear at the top of the timeline indicating the sections that have been prerendered.

Prerendered sections




As a default, these preview files are saved when a project is closed. To delete these files when you close the project, from the **Options** menu, choose **Preferences** and, on the **General** tab, clear the **Save active previews on project close** check box.

You can set the location of these preview files by clicking the **Project Video Properties** button ( ) and choosing a **Prerendered files folder** in the Project Properties dialog. Ideally, this folder should be on a different physical drive from where Windows is installed. You can delete prerendered preview files from your hard disk by choosing **Clean Up Prerendered Video** from the **Tools** menu.

**Note:** *Each prerendered section will consist of no more than 10 seconds (approximately 40 megabytes). Because selective prerendering creates multiple files, minor editing on the timeline will not invalidate all of your prerendered video—only the sections you modify will need to be rerendered.*

### Building dynamic RAM previews

Video frames are automatically dropped when previewing if the computer can't keep up with processing demands. This means that you may not be seeing all video frames as you preview your project. If you prefer not to prerender your project, there is another option for improving previews of selected portions of a project. A portion of your RAM is dedicated to cache video frames that Vegas Pro software cannot render in real time.

A cache of 16 MB is automatically maintained for dynamic RAM previews. To change the cache amount, choose **Preferences** from the **Options** menu and change the **Dynamic RAM Preview Max** value on the **Video** tab.

**Note:** *Although not all frames appear in previews of a project, all frames are included when you render a file. For more information, see* *Rendering a project on page 363*.

You can make a time selection and add each frame in the selection to the cache. Once the frames are cached, all video frames can display in a selection.

1. Select a region containing the frames you want to cache.
2. From the **Tools** menu, choose **Build Dynamic RAM Preview**.

   Vegas Pro software plays through the time selection and builds the cache frame by frame.

## Using split-screen previewing

Click the **Split Screen View** button ( ) in the Video Preview window to turn split-screen previews on or off.

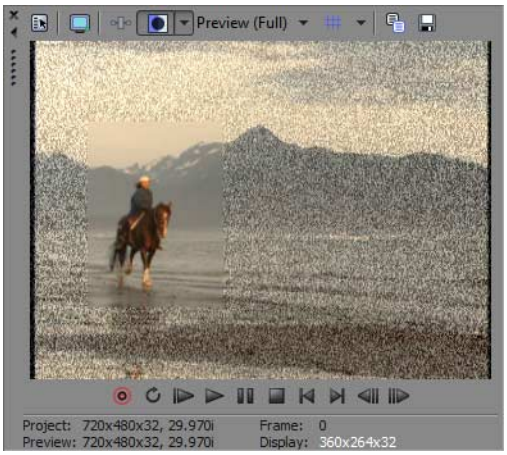
Split-screen previews allow you to split the Video Preview window so you can see your affected and unaffected video or your video and the contents of the clipboard at the same time. Use split-screen previews to fine-tune video effects or to match colors for color correction.

**Note:** *The Video Preview window temporarily enters split-screen preview mode when you slip-trim a video event. This temporary split-screen mode allows you to see the event's first and last frame as you trim. You can toggle this preview mode by selecting or deselecting the* **Video Event Edge Frames** *option on the* **View** *menu.*

### Previewing affected and unprocessed video

1. Click the down arrow next to the **Split Screen View** button ( ) and choose **FX Bypassed** from the menu.
2. Select the **Split Screen View** button ( ). The cursor is displayed as a .
3. Choose a preset selection or drag in the Video Preview section to create a selection. This selection will display the unprocessed video. In the following example, the Add Noise plug-in was applied to the event, and the selection displays the original video.

> **Tip:** *Double-click in the Video Preview window to select the full window, or drag again to replace the existing selection.*




### Showing the video at the cursor position and the contents of the clipboard

1. Position the cursor on the timeline and click the **Copy Snapshot** button ( ) in the Video Preview window to copy a frame to the clipboard.
2. Position the cursor at another point on the timeline.
3. Click the down arrow next to the **Split Screen View** button ( ) and choose **Clipboard** from the menu.
4. Select the **Split Screen View** button ( ).
5. Choose a preset selection or drag in the Video Preview section to create a selection. This selection will display the contents of the clipboard.

> **Tip:** *Double-click in the Video Preview window to select the full window, or drag again to replace the existing selection.*

### Changing the selection for displaying split-screen views

Click the down arrow next to the **Split Screen View** button ( ) and choose **Select Right Half**, **Select Left Half**, or **Select All** to indicate which portion of the Video Preview window you want to use to display unprocessed video or the contents of the clipboard.

When the **Split Screen View** button ( ) is selected, the cursor is displayed as a . Drag a rectangle in the Video Preview window to create a custom selection.

## Identifying safe areas

The Video Preview window displays the entire video frame data. However, most television monitors do not display all of this data. Previewing the video on a television monitor is the only way to verify what frame information will display. You should also note that individual television monitors vary in what they display. While there is no substitute for previewing on a television, safe areas are a good method of estimating the extent of the masking.

1. Click the down arrow next to the **Overlays** button ( ) and choose **Safe Areas**.
2. Click the **Overlays** button to toggle the safe areas display on or off. The display shows two areas:
   - The safe action area is the frame area that is visible on a television screen.
   - The safe title area is a suggested area to limit the extent of titles. It is always smaller than the safe action area.

**Tip:** *To customize safe area sizes, choose* **Preferences** *on the* **Options** *menu,* **and** *on the* **Video** *tab, enter the* **Action safe area** *and* **Title safe area** *values as a percent of the frame size. For more information, see* *Video tab on page 406*.

## Viewing the grid

The Video Preview window can display vertical and horizontal lines over your video. You can use the grid to help you align objects. To view the grid, click the down arrow next to the **Overlays** button ( ) and choose **Grid**.

Set the grid spacing using the **Horizontal grid divisions** and **Vertical grid divisions** settings on the **Video** tab in the Preferences dialog.

## Viewing closed captions

If you're working with a video that contains closed captions, you can preview your captions by using overlays in the Video Preview window.

Click the down arrow next to the **Overlays** button ( ) and select CC1, CC2, CC3, or CC4 to turn on the caption type that you want to preview.

## Isolating color channels

The Video Preview window allows you to select a specific channel to be isolated and whether the channel should be displayed in grayscale only. To display a channel, click the down arrow next to the **Overlays** button ( ) and choose a color channel.

**Note:** *Use the* **Alpha as Grayscale** *setting to isolate the Alpha channel mask and display it in grayscale.*

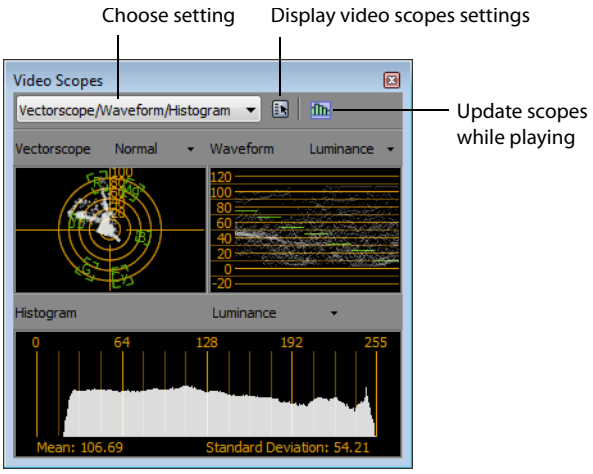
## Monitoring video with scopes

From the **View** menu, choose **Video Scopes** to toggle the display of the Video Scopes window.

Broadcast video uses a narrower range of color than the RGB you see on your computer. When you broadcast a project that contains out-of-range colors, you can introduce image problems or even noise into the audio stream.

Use the scopes to analyze the your video and adjust accordingly with the Brightness and Contrast, Broadcast Colors, Color Corrector, Color Corrector (Secondary), and Levels plug-ins before rendering.

Choose a setting from the drop-down list to choose which scope you want to display.




**Note:** *If your video hardware will add a 7.5 IRE setup, click the* **Settings** *button ( ) and select the* **7.5 IRE Setup** *check box in the Video Scopes Settings dialog. Black will be displayed as 7.5 in the waveform monitor. If your video hardware does not add a 7.5 setup, clear the check box, and black will be displayed as 0.*

### Displaying chrominance using the vectorscope monitor

The vectorscope monitor in the Video Scopes window allows you to monitor the chrominance (color content) of your video signal. The monitor plots hue and saturation on a color wheel.

The vectorscope displays targets for broadcast-legal saturations of red (R), magenta (Mg), blue (B), cyan (Cy), green (G), and yellow (Yl). Individual colors in your video signal are displayed as dots in the vectorscope. A dot's distance from the center of the scope represents its saturation, and the angle of the line from the dot to the center of the scope represents its hue.

For example, if an image has a blue cast, the distribution of dots in the vectorscope will be concentrated toward the blue portion of the color wheel. If the image includes out-of-range blue values, vectorscope display will extend beyond the blue target.

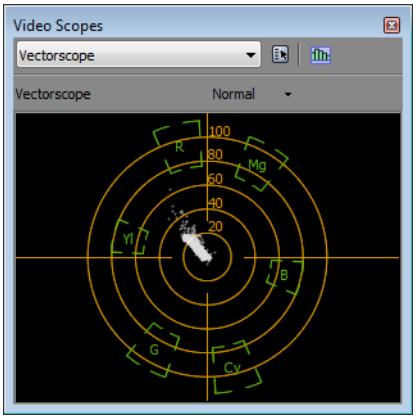
You can use the vectorscope to calibrate color between scenes. Without calibration, you may see noticeable color differences between scenes from multicamera shoots.

1. From the **View** menu, choose **Video Scopes** to toggle the display of the Video Scopes window.
2. Choose **Vectorscope** from the drop-down list.
3. Position the cursor in the frame you want to analyze. If the **Update Scopes While Playing** button ( ) is selected, you can monitor your video during playback.

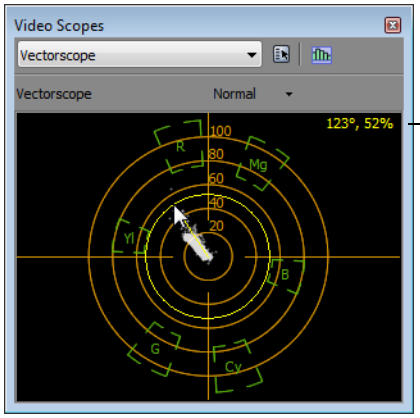
4. The vectorscope monitor displays the chrominance of the video signal:

Frame

Vectorscope display of frame




5. Hover over a portion of the monitor to display the chroma value at the pointer position:




Chroma value

### Displaying luminance using the waveform monitor

The waveform monitor in the Video Scopes window allows you to monitor the luminance (brightness or Y component) of your video signal. The monitor plots luminance on the vertical axis and the width of the current frame on the horizontal axis.

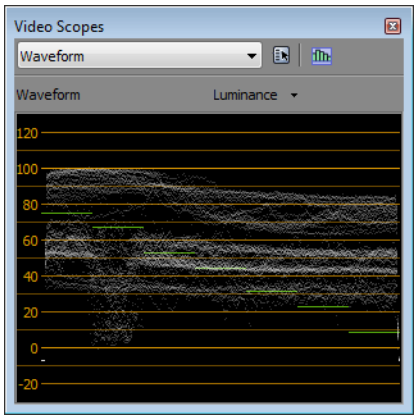
If you want to include chroma (color or C component) information in the waveform monitor, choose **Composite** from the drop-down list at the top of the monitor window. When you choose **Luminance**, chroma information is omitted.

1. From the **View** menu, choose **Video Scopes** to toggle the display of the Video Scopes window.
2. Choose **Waveform** from the drop-down list.
3. Position the cursor in the frame you want to analyze. If the **Update Scopes While Playing** button ( ) is selected, you can monitor the waveform during playback.

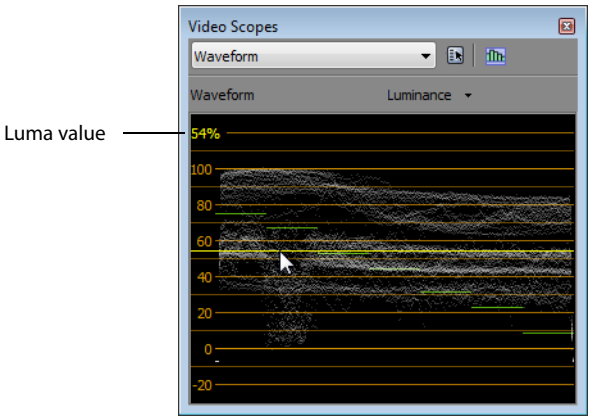
4. The waveform monitor displays the luminance of the video signal:

Frame

Waveform display of frame




5. Hover over a portion of the monitor to display the luma value at the pointer position:




### Displaying color levels and contrast using the histogram monitor

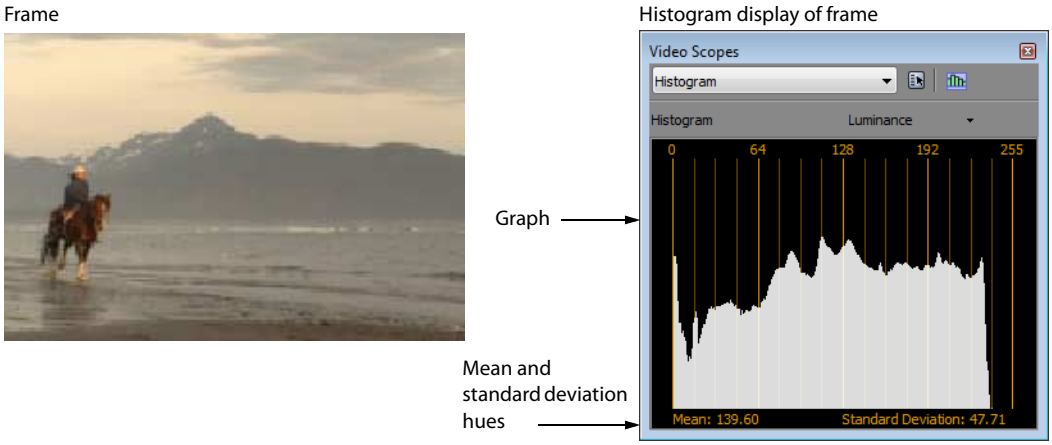
The histogram monitor in the Video Scopes window allows you to monitor color levels and contrast of your video. Use the histogram before rendering your project to find and correct out-of-range values that could cause problems on the destination playback device.

The bar graph plots the number of pixels that exist for each color intensity. For example, when using the **Blue** setting, the vertical axis represents the number of pixels, and the horizontal axis represents the RGB color range from 0,0,0 to 0,0,255.

To get acquainted with the histogram, use an external monitor to preview your video and watch the video output and histogram as you use plug-ins to modify the colors.

1. From the **View** menu, choose **Video Scopes** to toggle the display of the Video Scopes window.
2. Choose **Histogram** from the drop-down list.
3. Choose a histogram type from the menu:
   - **Luminance:** charts the luminance or brightness of colors in your video.
   - **Red:** charts the red tones in your video.
   - **Green:** charts the green tones in your video.
   - **Blue:** charts the blue tones in your video.
   - **Alpha:** charts the alpha channel (transparency) in your video.
   - **Luminance/R/G/B:** stacks luminance and RGB charts.
4. Position the cursor in the frame you want to analyze. If the **Update Scopes While Playing** button ( ) is selected, you can monitor your video during playback.
5. Use the histogram to evaluate the colors in your video. The **Mean** value indicates the average intensity of all pixels in the graph, and the **Standard Deviation** value indicates the average percentage by which pixels in the graph vary from the **Mean** value.

6. Use plug-ins such as Brightness and Contrast, Broadcast Colors, and Levels to adjust the color. *For more information, see* *Applying video effects on page 301*.

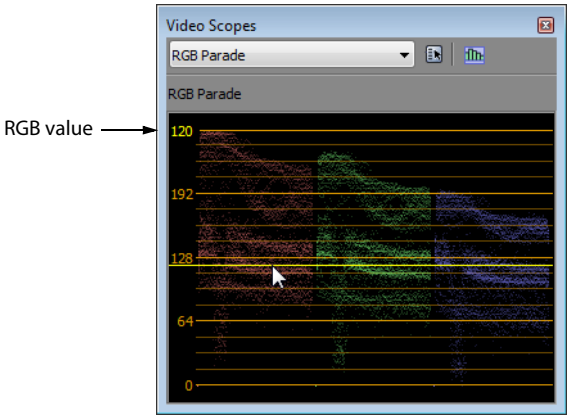



### Displaying RGB components with RGB parade monitor

The RGB parade monitor in the Video Scopes window displays waveforms for the red, green, and blue components of your video signal. The monitor plots RGB values from 0-255 on the vertical axis and three times on the horizontal axis.

The parade monitor helps you determine whether the individual RGB components of your video signal are within limits and whether the total video signal is clipping.

1. From the **View** menu, choose **Video Scopes** to toggle the display of the Video Scopes window.
2. Choose **RGB Parade** from the drop-down list.
3. Position the cursor in the frame you want to analyze. If the **Update Scopes While Playing** button ( ) is selected, you can monitor your video during playback.
4. The waveform monitor displays the RGB values of the video signal. Hover over the monitor to display the RGB value at the pointer position:



## Adjusting video scope settings

Click the **Settings** button ( ) in the Video Scopes window to set your display options. These options adjust the display of data in the Video Scopes window and have no effect on your data.

### 7.5 IRE setup

If your video hardware will add a 7.5 IRE setup, you can configure the Video Scopes window so the display will be consistent with an external scope connected to a device that adds 7.5 IRE setup.

NTSC video in the United States adds 7.5 IRE setup to convert black to 7.5 IRE. Consumer video hardware typically does not add 7.5 IRE setup, and most professional hardware allows you to turn 7.5 IRE setup on or off. PAL video and NTSC video in Japan do not add setup.

Refer to your video hardware documentation to determine whether your hardware adds 7.5 IRE setup.

1. Click the **Settings** button ( ) in the Video Scopes window.
2. Select the **7.5 IRE** Setup check box in the Video Scopes Settings dialog.

   Black will be displayed as 7.5 in the waveform monitor. If your video hardware does not add 7.5 setup, clear the check box.

### Studio RGB display

RGB values on your computer can range from 0 to 255. Studio RGB values range from 16 to 235. If you want to limit the display of the Video Scopes window to studio RGB standards, perform the following steps:

1. Click the **Settings** button ( ) in the Video Scopes window.
2. Select the **Studio RGB (16 to 235)** check box in the Video Scopes Settings dialog.

Whether you need to use the Studio RGB (16 to 235) setting depends on the codec you will use to render your video before printing to tape. Suggested settings follow. Refer to the codec's documentation to determine whether the Studio RGB (16 to 235) check box should be selected.

| Codec | Studio RGB Setting |
|---|---|
| Sony DV | On |
| Microsoft® DV | Off |
| Matrox® DV | Off |
| MainConcept™ DV | Off |
| Canopus® | On |
| Apple® QuickTime™ DV | Off |

You can render using a third-party DV codec by choosing a specific codec from the **Video format** drop-down list on the **Video** tab of the Custom Template dialog.

## Using an external monitor

You can feed video directly from the timeline to a television monitor or secondary Windows display. With this feature, you can free up valuable space in the Vegas Pro window by viewing a full-screen preview of your project on a different display, or you can make your final editing decisions on a broadcast monitor (which differs significantly from a computer monitor) before printing the project to tape.

This feature supports video output only; audio is not output to the external monitor.

**Notes:**

- *If you intend to deliver your project in an interlaced format, previewing on a computer monitor is not a substitute for previewing on an interlaced broadcast monitor.*
- *Vegas Pro software allows you to use one external video device at a time. The external monitor display will be unavailable during video capture.*
- *When using an external video monitor, you need to enable external-monitor preview each time you start Vegas Pro. This change was made to prevent the possibility of hiding the main Vegas Pro window behind the secondary display when monitors are improperly configured.*

### Configuring an external monitor

Prior to previewing on an external monitor, you'll need to configure your system to use this feature. From the **Options** menu, choose **Preferences** and then click the Preview Device tab to configure an external monitor. Your video will be sent to this device when you click the **Preview on External Monitor** button () in the Video Preview window. *For more information, see Setting preferences on page 413.*

### Previewing video on a secondary Windows display

If your Windows desktop is extended across multiple displays, you can use one of those displays to preview the timeline with no A/V synchronization drift—perfect for ADR and foley work.

**Important:** *If you intend to deliver your project in an interlaced format, previewing on a computer monitor is not a substitute for previewing on an interlaced broadcast monitor.*

Preview requirements:

- A multiple-output graphics card that supports 3D acceleration (or multiple graphics cards: you could install AGP and PCI video cards in your system, for example).

  You can also use the Windows Graphics Card device on a computer with a single monitor. When you enable the external monitor, the video preview will fill your screen.
- A CRT, LCD, or projector connected to your computer's secondary video output.

  If you have a video card with DVI outputs, you can use a DVI-to-HDMI converter to connect to an HDMI monitor.
- The **Extend my Windows desktop onto this monitor** check box must be selected on the **Settings** tab of the Display Properties dialog (Start > Settings > Control Panel > Display).

**Notes:**

- *Vegas Pro software allows you to use one external video device at a time. The external monitor display will be unavailable during video capture.*
- *When using an external video monitor, you need to enable external-monitor preview each time you start Vegas Pro. This change was made to prevent the possibility of hiding the main Vegas Pro window behind the secondary display when monitors are improperly configured.*

Follow the steps below to set up your preview:

1. Use the **Preview Device** tab in the Preferences dialog to configure the display you want to use as a video preview monitor. *For more information, see Preview Device tab on page 417.*
2. Select the **Preview on External Monitor** button ( ) in the Video Preview window.

   You can turn off external preview by pressing Alt+Shift+4 or by clicking the secondary display and pressing Esc.

> **Tip:** *Video is sent to your secondary display and the Video Preview window at the same time. If you experience dropped frames, try clearing the* **Display frames in Video Preview window during playback** *check box on the* **Preview Device** *tab of the Preferences dialog.*

### Viewing on an external monitor via IEEE-1394

You can send video directly from the timeline to a television monitor. With this feature, you can make your final editing decisions on a broadcast monitor (which differs significantly from a computer monitor) before printing the project to tape.

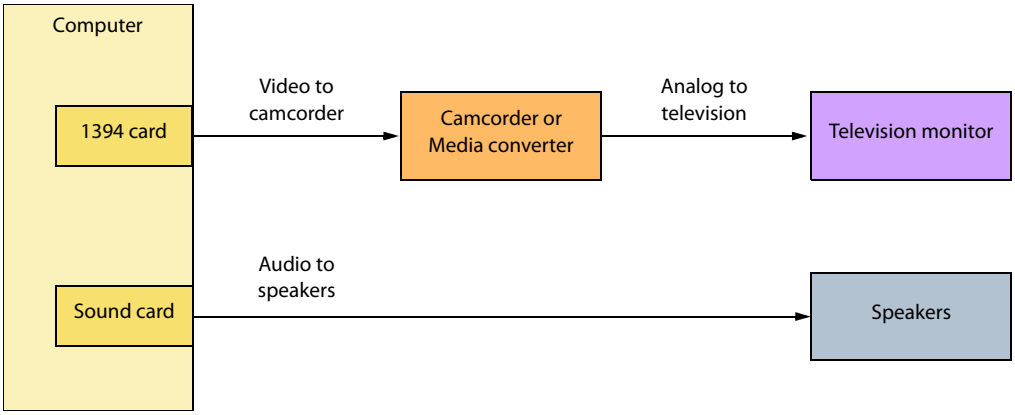
IEEE-1394/FireWire external monitor requirements:

- OHCI-compliant IEEE-1394 DV card
- DV camcorder or DV-to-analog converter

> **Notes:**
>
> - *Vegas Pro software allows you to use one external video device at a time. The external monitor display will be unavailable during video capture.*
> - *When using an external video monitor, you need to enable external-monitor preview each time you start Vegas Pro. This change was made to prevent the possibility of hiding the main Vegas Pro window behind the secondary display when monitors are improperly configured.*

#### Setting up an external monitor

The diagram below shows the preferred setup for sending video from the Vegas Pro timeline to an external television monitor.




The video is converted to DV format and is sent through the IEEE-1394 card to the DV device (camcorder or DV-to-analog media converter). The DV device sends analog output to the television monitor.

Use the **Preview Device** tab in the Preferences dialog to configure your IEEE-1394 card. *For more information, see Preview Device tab on page 417.*

> **Note:** *The DV device must support pass-through in order to use an external monitor. Some PAL camcorders do not support this feature.*

### Previewing audio

External monitor previewing differs in one respect from printing to tape from the timeline: no audio is sent through the preview device. As shown in the illustration above, the audio is routed to the sound card and then on to the mixer (if present) and speakers. This allows you to mix your audio on better speakers than are typically found in television monitors.

Before printing to tape, you might want to preview the audio through the television monitor speakers to ensure a good TV mix. You can use the print-to-tape feature to send the full video and audio to the external monitor. Follow the steps for printing to tape from the timeline but do not set the camcorder to record. Both the video and audio are sent through the 1394 card to the external monitor. *For more information, see* *Printing video to tape from the timeline on page 378*.

### Enabling external monitor preview

1. Use the **Preview Device** tab in the Preferences dialog to configure the display you want to use as a video preview monitor. *For more information, see* *Preview Device tab on page 417*.
2. Select the **Video Preview on External Monitor** button ( ) in the Video Preview window.

   You can turn off external preview by pressing Alt+Shift+4.

**Tip:** *Video is sent to the external monitor and the Video Preview window at the same time. If you experience dropped frames, try clearing the* **Display frames in Video Preview window during playback** *check box on the* **Preview Device** *tab of the Preferences dialog. For more information, see* *Preview Device tab on page 417*.

### Optimizing preview quality

Keep in mind that complex effects and/or transitions may not play back in real time from the timeline. What effects can and cannot be played back depends on the speed of your computer. You may want to prerender more complex portions of a project. *For more information, see* *Prerendering video on page 347*.

**Note:** *The compression settings used to create the prerendered video must be identical to your captured files for timeline playback to work.*

## Viewing on an external monitor via SDI

You can send video directly from the timeline to a video monitor connected to a supported SDI card.

**Important:** *Blackmagic Design DeckLink HD Extreme/Intensity Pro/HD Extreme 3D and AJA Io Express, KONA 3X, LH, LHe, LHi, LS, and LSe cards are supported. Please note that AJA XENA cards are now branded as KONA cards. For more information, please see the AJA Web site at http://www.aja.com/products/kona/transition.php.*

*For the latest information about supported hardware, please see our Web site at http://www.sonycreativesoftware.com/vegaspro/io#sdi.*

**Notes:**

- *Vegas Pro software allows you to use one external video device at a time. The external monitor display will be unavailable during video capture.*
- *When using an external video monitor, you need to enable external monitor preview each time you start Vegas Pro software. This change was made to prevent the possibility of hiding the main Vegas Pro window behind the secondary display when monitors are improperly configured.*

1. Use the **Preview Device** tab in the Preferences dialog to configure your SDI card. *For more information, see Preview Device tab on page 417.*
2. Select the **Video Preview on External Monitor** button ( ) in the Video Preview window.

   You can turn off external preview by pressing Alt+Shift+4.

**Tip:** *Video is sent to the external monitor and the Video Preview window at the same time. If you experience dropped frames, try clearing the* **Display frames in Video Preview window during playback** *check box on the* **Preview Device** *tab of the Preferences dialog. For more information, see Preview Device tab on page 417.*

Chapter 20

# Saving, Rendering, and Printing Projects

Vegas® Pro software allows you to save and render projects into many different multimedia formats. When you render your Vegas Pro project, the project itself is not altered, but rather can be rendered in any number of different formats.

This chapter explains saving a project and using the Save As and Render As functions. In addition, you will find reference information for the rendering options available. This chapter also describes the different options for delivering your projects, such as printing to tape and uploading to YouTube.

## Saving a project

A Vegas Pro project is saved as a small .veg file. This file contains all of the information needed to recreate your project: source file locations, trimming, track and bus plug-ins, volume and panning envelopes, bus assignments, assignable effects settings, etc. This is not the same as creating a final media file, which is done with the Render As command.

**Note:** *The option is also provided of saving a project as an Edit Decision List (EDL). For more information, see* *Creating an EDL on page 276*.

1. From the **File** menu, choose **Save**.

   The first time a project is saved, the Save As dialog appears. In subsequent saves, the Save As dialog is bypassed, your existing file name is retained, and your project is updated to include any changes.
2. Select **Vegas Project File (.veg)** from the **Save as type** list.
3. Select the drive and folder where you want to store the project.
4. Type the project name in the **File name** box.
5. Click **Save**.

### Renaming or creating a copy of a project (using Save As)

After you have been working with your project, you can use the **Save As** command in the **File** menu to create a copy of the small project file with a different name. Since multimedia projects can be very complex, and since Vegas Pro project files are so small, saving a number of different versions of a project is a low-risk way to try new techniques.

1. From the **File** menu, choose **Save As**. The Save As dialog is displayed.
2. Select the drive and folder where you want to store the project.
3. Type a new name in the **File name** box.
4. From the **Save as type** drop-down list, choose the format in which you want to save the project.

| Extension | Format Name | Description |
|---|---|---|
| .veg | Vegas Pro project | This option saves the references to media files used in the project. Also saved is project information, track effects, envelopes, bus assignments, and output properties. The .veg file does not combine events into a single file. |
| .txt | EDL text file | This option creates a text version of event placements in the timeline. This text description can then be imported into a database or text application for modification or other purposes. |
| .aaf | Edit Protocol Compliant AAF File | These options create AAF (Advanced Authoring Format) files that you can use to exchange projects between applications. For example, if your postproduction facility uses a tool other than Vegas Pro software, you could provide your project as an AAF file. |
| .aaf | Avid Legacy AAF File | |

5. Select the **Copy media with project** check box if you want to create copies of each of the project's media files in the same location as the project file. This allows you to collect all of a project's assets in a single location.
6. Click the **Save** button.
7. If you selected the **Copy media with project** check box, a dialog is displayed to allow you to specify how you want to copy media files:
   - Select the **Copy source media** radio button to copy the entire source media files to your project folder.

**Note:** *Any project media files from folders outside the project folder are copied to the project folder. Media files that are saved in folders below the project folder are not copied.*

   - Select the **Create trimmed copies of source media** radio button and enter a value in the **Extra head and tail** box to reduce the number and size of media files necessary to represent your project.

   Your project will be scanned to determine how much of each media file is being used and those regions will be rendered to new media files. The amount of time specified in the **Extra head and tail** setting will be added before and after the media file to allow subsequent edits. All events are then updated to point to the new files. Finally, inactive takes are removed from the project, and the project is saved.

**Note:** *The newly rendered files will match the source files' properties as closely as possible:*

- *Audio/video events are saved in a new AVI file. You can trim DV AVI, uncompressed AVI, Sony YUV AVI, and CineForm AVI files. Because of the lossy nature of other video formats, those video files will not be trimmed, but will simply be copied to the project folder.*
- *Audio-only events will be rendered to the Wave format if under 2 GB (or Wave64 if over 2 GB), and DV files will be rendered as DV AVI files.*

### Autosaving a project

A backup copy of your project is automatically saved every five minutes. If your system crashes, you are prompted to open the backup file the next time you start the program.

Backup files are saved in the location specified in the **Temporary files folder** box on the **General** tab of the Preferences dialog. Files are saved with the .autosave.veg extension and are deleted when you close Vegas Pro software.

If you prefer not to autosave your project, you can clear the **Enable autosave** check box on the **General** tab of the Preferences dialog.

Vegas Pro software also creates .veg.bak files in your project folder when you save a project to allow you to return to the project's last-saved state. Creation of .veg.bak files is independent of autosaving.

## Rendering a project

Rendering refers to the process of converting a project into a single new multimedia file and formatting it for the desired playback method: media player, Internet streaming media, CD-ROM, video tape, etc. The project file is not overwritten, deleted, or altered during the rendering process. You can return to the original project to make edits or adjustments and render it again later.

Rendering a video file can take quite a bit of time, depending on the complexity of your project, the speed of your CPU, and the final format you have selected. For longer projects, you might want to plan to render your movie overnight or when you are not using your computer.

If you've prerendered your project, those prerendered sections can be used for your final render when the destination formats match.

When you render video to any of the following formats, unedited video frames are passed through without recompression:

- DV AVI
- DV MXF
- IMX MXF (IMX 24p MXF is not supported for no-recompress rendering)
- HD MXF
- MPEG-2 (for files such as those from HDV and DVD camcorders)
- XDCAM EX supports smart rendering across the following formats:
  - SP 18.3 Mbps CBR 1280x720p to/from XDCAM EX and HDV HD-1
  - SP 25 Mbps CBR 1440x1080i to/from XDCAM EX, XDCAM HD, and HDV HD-2
  - HQ 35 Mbps VBR 1440x1080 to/from XDCAM EX and XDCAM HD
  - HQ 35 Mbps VBR 1280x720p to/from XDCAM EX
  - HQ 35 Mbps VBR 1920x1080 to/from XDCAM EX

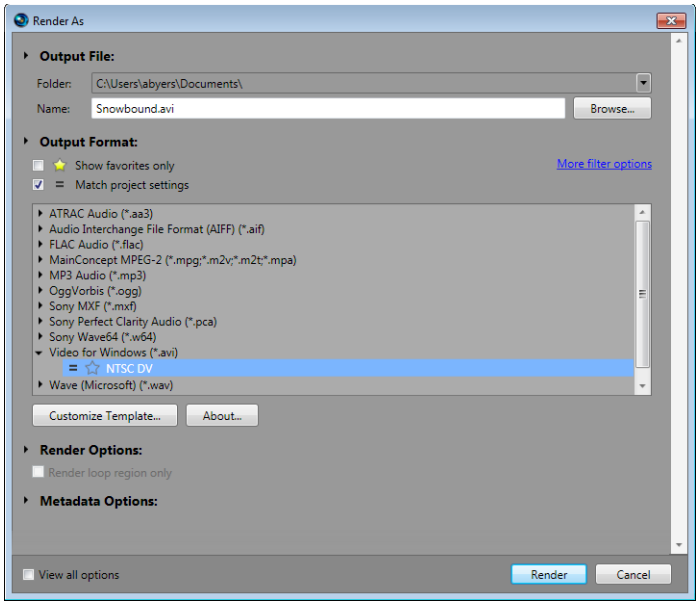
**Notes:**

- *In order to perform rendering without recompression, the width, height, frame rate, field order, profile, level, and bit rate of the source media, project settings, and rendering template must match. Frames that have effects, compositing, or transitions applied will be rendered.*

  *You can clear the* **Enable no-recompress long-GOP rendering** *check box on the* **General** *tab of the Preferences dialog to turn the feature off. For more information, see* *General tab on page 413*.

- *When you route busses to hardware outputs, the outputs from those busses will not be included in the mix when you render your project.*
- *For specific information on 5.1 surround projects, see* *Rendering surround projects on page 259*.

1. From the **File** menu, choose **Render As**. The Render As window is displayed.




2. Use the Output File controls to choose where you want to save your file:
   a. The **Folder** box displays the path to the folder where your file will be saved. Click the down arrow to choose a recently used folder, or click the **Browse** button to specify a new folder.
   b. Type a name in the **Name** box, or click the **Browse** button and select a file in the browse window to replace an existing file.
3. Use the Output Format controls to choose the type of file you want to create.

   The Output Format box displays the file types and formats you can use to render your file. You can double-click headings (or click the arrow buttons) to expand or collapse lists of available templates. Click a template to select it and use that format for rendering, or select a template and click the **Customize Template** button to modify the template's settings.

### Tips:

- *You can type in the* **Search render templates** *box to find templates. For example, if you wanted to render a video for a PSP™ (PlayStation® Portable) system, you could type "PSP" in the box to display only templates that include the term "PSP" in the template name or description.*
- *If you have templates that you use often, you can create favorites. Click the gray star next to a template name to mark that template as a favorite. You can then select the* **Show favorites only** *check box to display only your favorites in the Render As dialog.*
- *Templates that match your project settings (frame size, pixel aspect ratio, and frame rate), are displayed with an equal sign (=) in the template list. If you want to display only templates that match your project settings, select the* **Match project settings** *check box.*
- *For even more control over the template list, click* **More filter options**. *You can display audio/video templates or match your project's audio channel count, sample rate, frame rate, frame size, aspect ratio, or field order.*
- *To create a 5.1 surround audio stream for your DVD, render your audio using the Dolby Digital AC-3 Studio plug-in with the* **5.1 Surround DVD** *or* **5.1 Surround DVD, AGC on** *template.*

**Note:** *You'll need to choose a rendering template that inserts pulldown fields to create a standard DV file if your project properties are set to 24p or if you selected the* **Allow pulldown removal when opening 24p DV** *check box on the* **General** *tab of the Preferences window. Use the* **NTSC DV 24p (inserting 2-3-3-2 pulldown)** *template if you intend to bring the file back into the timeline as source material.*

*If you cleared the* **Allow pulldown removal when opening 24p DV** *check box before adding your media and your project properties are not set to 24p, your 24p video is read as 29.97 fps interlaced video (60i), so you can choose whichever NTSC DV or PAL DV template suits your project requirements.*

4. If you're rendering to .wav, .w64, .avi, or .mxf format, you can select the **Enable multichannel mapping** check box to render a file with multiple audio channels.

   For more information about rendering multichannel audio and setting up multichannel mapping, see *Rendering multichannel audio files on page 366*.

5. Select or clear the check boxes in the Render Options section as needed:

   a. Select the **Render loop region only** check box if you want to save only the portion of the project that is contained within the loop region. **Loop Playback** does not need to be selected for this option to work.

   b. Select the **Stretch video to fill output frame size (do not letterbox)** check box when you are rendering to an output format with a slightly different aspect ratio than your project settings. This will prevent black bars from appearing on the top and bottom or the sides of the output.

   c. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties window for your rendered file.

      When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated. You can use this setting to proof your project on an unrotated display.

6. Use the Metadata Options controls to whether information about your project is saved with the rendered media file:

   a. If the selected file type supports it, you can select the **Save project markers in media file** check box to include markers, regions, and command markers in the rendered media file.

   b. Select the **Save project as path reference in rendered file** check box if you want to save the path to your Vegas Pro project in the rendered file. Saving the project path allows you to easily return to the source project if you use your rendered file in another project.

**Notes:**

- *The project information in the rendered file is a reference to a project file only. If you modify the project file after rendering, the project data will no longer match the rendered file. To edit a project using a path reference, the project file and all media must be available on your computer.*
- *The check box will be unavailable if you haven't saved your project or if you're rendering using a third-party file-format plug-in.*

7. Click the **Render** button. A window is displayed to show rendering progress.
8. When rendering is complete, click the **Open** button to play the file with its associated player, or click **Open Folder** to open the folder where you saved the file.

## Rendering still-image sequences

1. If you want to render only a portion of your project, create a time selection and/or solo the tracks you want to include in the still-image sequence.
2. From the **File** menu, choose **Render As**. The Render As window is displayed.
3. In the **Name** box, type the base file name you want to use for rendered images. Files will be numbered automatically using this file name.
4. In the Output Format box, double-click **Image Sequence** to display a list of image formats and click the image format you want to use.
5. Select the **Render loop region only** check box if you want to save only the portion of the project that is contained within the loop region. The **Loop Playback** button ( ) does not need to be selected for this option to work.
6. Select the **Stretch video to fill output frame size (do not letterbox)** check box when you are rendering to an output format with a slightly different aspect ratio than your project settings. This will prevent black bars from appearing on the top and bottom or the sides of the output.
7. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for your rendered file.

   When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated. You can use this setting to proof your project on an unrotated display.
8. Click the **Render** button. A window is displayed to show rendering progress.

   When rendering is complete, you can click the **Open Folder** button to open the folder where you saved the files.

## Rendering multichannel audio files

If you want to render a single audio file with multiple audio channels, you can render to one of the following formats:

- WAV/WAV64 (*For information about rendering 5.1 channel WAV/WAV64 files, see Rendering surround projects on page 259.*)
- AVI
- Material Exchange Format (MXF)

**Note:** *MXF files require a video stream.*

| Render format | Number of channels |
|---|---|
| DV MXF | Always contains 4 audio channels.<br>You can use the **Channels** drop-down list on the **Audio** tab of the Custom Template dialog to choose how many channels will be filled with audio. For example, if you choose **2** from the **Channels** drop-down list, the rendered file will contain 4 audio channels: two channels will contain audio, and two channels will contain silence. |
| IMX MXF | Always contains 8 audio channels.<br>You can use the **Channels** drop-down list on the **Audio** tab of the Custom Template dialog to choose how many channels will be filled with audio. For example, if you choose **2** from the **Channels** drop-down list, the rendered file will contain 8 audio channels: two channels will contain audio, and six channels will contain silence. |
| HD MXF | Can contain 2 or 4 audio channels.<br>You can use the **Channels** drop-down list on the **Audio** tab of the Custom Template dialog to choose how many channels will be rendered. For example, if you choose **2** from the **Channels** drop-down list, the rendered file will contain only 2 audio channels. |

**Note:** *WMV/WMA, AC-3, and ATRAC support multichannel surround formats; channel mapping is not supported. For more information, see Rendering surround projects on page 259.*

1. Create your project.
2. In the Mixer window, add a bus for each channel (or channel pair) you want to include in your rendered file.

   For example, if you wanted to create a six-channel .wav file, you could set up your mixer with three or six busses. If you use three busses, the left and right channels of each bus will be saved to a separate channel. If you use six busses, you can save the mono downmix from each bus as a separate channel.

**Note:** *If you're working with a 5.1 surround project, you can map the six channels from the Surround Master bus to six output channels.*

3. Assign tracks to busses to map the audio in your project to the desired channel.
4. From the **File** menu, choose **Render As** to display the Render As window.
5. Use the Output File controls in the Render As window to choose the location where you want to use to save your file.
6. Select the **Enable multichannel rendering** check box.
7. Click the **Channels** button if you want to map the busses in your project to channels in the rendered file. If you don't specify a channel mapping, Vegas Pro will not render a multichannel file.
   a. In the Channel Mapping window, select the check box for each bus you want to include in the rendered file. Each stereo bus will be saved to two channels in the rendered file. If you want to save a bus to a single channel, select the **(Mono downmix)** check box for that bus.
   b. If you want to change order of the busses in the channel mapping, select the bus and click the **Move Up** or **Move Down** button.
   c. Click **OK** to close the Channel Mapping window and return to the Render As window.

**Tip:** *Channel mapping is also available when printing to tape from the timeline, rendering to a new track, and exporting video to an XDCAM disc.*

8. Use the Output Format controls to choose the type of file you want to create.

   The Output Format box displays the file types and formats you can use to render your file. You can double-click headings (or click the arrow buttons) to expand or collapse lists of available templates. Click a template to select it and use that format for rendering, or select a template and click the **Customize Template** button to modify the template's settings.

   If you choose **Default Template** when rendering to .wav, .w64, or .avi, the number of channels will match the number of channels specified in the Channel Mapping window.

**Note:** *If you choose a rendering template that specifies more channels than you have set up in the Channel Mapping window, the additional channels will be rendered as silence.*

*If you choose a template that specifies fewer channels than you have set up in the Channel Mapping window, the setting from the template will be used. Additional mapped channels will be ignored.*

9. Select or clear the check boxes in the Render Options section as needed:
   a. Select the **Render loop region only** check box if you want to save only the portion of the project that is contained within the loop region. **Loop Playback** does not need to be selected for this option to work.
   b. Select the **Stretch video to fill output frame size (do not letterbox)** check box when you are rendering to an output format with a slightly different aspect ratio than your project settings. This will prevent black bars from appearing on the top and bottom or the sides of the output.
   c. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties window for your rendered file.

      When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated. You can use this setting to proof your project on an unrotated display.
10. Use the Metadata Options controls to whether information about your project is saved with the rendered media file:
    a. If the selected file type supports it, you can select the **Save project markers in media file** check box to include markers, regions, and command markers in the rendered media file.

**b.** Select the **Save project as path reference in rendered file** check box if you want to save the path to your Vegas Pro project in the rendered file. Saving the project path allows you to easily return to the source project if you use your rendered file in another project.

**Notes:**

- *The project information in the rendered file is a reference to a project file only. If you modify the project file after rendering, the project data will no longer match the rendered file. To edit a project using a path reference, the project file and all media must be available on your computer.*
- *The check box will be unavailable if you haven't saved your project or if you're rendering using a third-party file-format plug-in.*

**11.** Click the **Render** button. A dialog is displayed to show rendering progress.

**12.** When rendering is complete, click the **Open** button to play the file with its associated player, or click **Open Folder** to open the folder where you saved the file.

## Rendering surround projects

Rendering a surround project creates six monaural files (AIFF, ATRAC, WAV/W64, or PCA) or a single 5.1-channel file (AC-3, WAV/W64, WMA, and WMV) that your authoring application can use to create DVD-Video or 5.1-channel music projects. *For more information, see Rendering surround projects on page 259.*

## Rendering MPEG format

Use the MainConcept plug-in to render MPEG files. The plug-in includes templates that will work well for most of your encoding needs, and you can create custom templates if you have special encoding requirements.

**Notes:**

- *Vegas Pro software does not create Video CDs, but you can use the MPEG plug-in to render files for your VCD-creation application. Consult the application's documentation to determine the file requirements before rendering.*
- *If you choose to save markers in your rendered MPEG-2 file, DVD Architect Pro will read those markers as chapter markers. Ensure the* **Render I-frames at markers** *check box is selected before rendering (in the Render As dialog, choose* **MainConcept MPEG-2** *from the* **Template** *drop-down list, and then click the* **Custom** *button. In the Custom Template dialog, select the* **Video** *tab and select the* **Render I-frames at markers** *check box).*

**Important:** *MPEG video requires frame widths that are divisible by 16 and frame heights that are divisible by 2. Noncompliant frame dimensions can cause unpredictable results or system instability.*

### Using default MPEG templates

When you browse rendering templates in the Render As dialog, a description of the selected template's settings is displayed below the list of templates. *For more information, see Rendering a project on page 363.*

### Creating custom MPEG templates

In the Render As dialog, choose **MainConcept MPEG-1** or **MainConcept MPEG-2** from the Output Format box and click the **Customize Template** button if you want to create your own MPEG encoding templates.

For information about the active page in the Custom Template dialog, click the **Help** button ( ).

**Important:** *Custom templates have many available options, and consequently, a lot of room for error. Verify your file requirements before creating a template. If you're using third-party DVD-burning software, for example, refer to the application's documentation to determine the application's file requirements.*

### Viewing MPEG-2 files on a computer

MPEG-2 files require an MPEG-2 decoder in order to view them in Windows Media Player and other applications. The Windows operating system does not include an MPEG-2 decoder, but you can download MPEG-2 decoders at *http://www.vcdhelp.com*. Sony Creative Software Inc. does not endorse or support any third-party MPEG-2 decoders.

## Rendering projects for use in DVD Architect Pro

If you have DVD Architect™ Pro software, you can avoid unnecessary transcoding or recompression by using Vegas Pro to render your media files in the appropriate formats prior adding them to your DVD Architect Pro project.

**Note:** *The Sony Creative Software Inc. AC-3 and MainConcept MPEG-2 encoders provide templates that will produce files that do not require recompression (unless the file size is too large to fit on a DVD).*

### AC-3 audio (.ac3)

| Sample Rate | Bit Rate | Channels |
|---|---|---|
| 48,000 Hz | 192 Kbps (64 Kbps to 640 Kbps is supported) | Stereo |
| 48,000 Hz | 448 Kbps (64 Kbps to 640 Kbps is supported) | 5.1 surround |

### PCM audio (.wav or .w64)

| Sample Rate | Bit Depth | Channels | Compression |
|---|---|---|---|
| 48,000 Hz | 16, 20, or 24 bit | Stereo | Uncompressed |
| 96,000 Hz | 16, 20, or 24 bit | Stereo | Uncompressed |

### NTSC MPEG video (.m2p, .mp2, .mpg, .mpeg, .mpv)

If you're using the MainConcept MPEG-2 encoder in Vegas Pro software, use the **DVD Architect NTSC video stream** or **DVD Architect 24p NTSC video stream** template to render your video stream. You'll need to render your audio stream separately according to the parameters listed in the AC-3 audio or PCM audio headings above.

If you're rendering with a different application, the following settings will produce a compliant NTSC MPEG-2 video stream.

| Frame Size | Frame Rate (fps) | Aspect Ratio | Maximum Group of Pictures | Maximum Bit Rate |
|---|---|---|---|---|
| 720x480 | 29.97 or 23.976 + 2-3 pulldown | 4:3 | 36 | 9.8 Mbps |
| 704x480 | 29.97 or 23.976 + 2-3 pulldown | 4:3 | 36 | 9.8 Mbps |
| 352x240 | 29.97 or 23.976 + 2-3 pulldown | 4:3 | 36 | 9.8 Mbps |
| 352x480 | 29.97 or 23.976 + 2-3 pulldown | 4:3 | 36 | 9.8 Mbps |
| 720x480 | 29.97 or 23.976 + 2-3 pulldown | 16:9 | 36 | 9.8 Mbps |
| 720x480 | 29.97 or 23.976 + 2-3 pulldown | 16:9 | 36 | 9.8 Mbps |

**Note:** *The MainConcept MPEG-2 encoder in Vegas Pro renders with the Low Delay flag turned off. If you're rendering with a different encoder, ensure Low Delay is turned off.*

### PAL MPEG video (.m2p, .mp2, .mpg, .mpeg, .mpv)

If you're using the MainConcept MPEG-2 encoder in Vegas Pro software, use the **DVD Architect PAL video stream** or **DVD Architect PAL Widescreen video stream** template to render your video stream. You'll need to render your audio stream separately according to the parameters listed in the AC-3 audio or PCM audio headings above.

If you're rendering with a different application, the following settings will produce a compliant PAL MPEG-2 video stream.

| Frame Size | Frame Rate | Aspect Ratio | Maximum Group of Pictures | Maximum Bit Rate |
|---|---|---|---|---|
| 704x576 | 25 fps | 4:3 | 30 | 9.8 Mbps |
| 352x576 | 25 fps | 4:3 | 30 | 9.8 Mbps |

| Frame Size | Frame Rate | Aspect Ratio | Maximum Group of Pictures | Maximum Bit Rate |
|---|---|---|---|---|
| 352x288 | 25 fps | 4:3 | 30 | 9.8 Mbps |
| 704x480 | 25 fps | 16:9 | 30 | 9.8 Mbps |

**Note:** *The MainConcept MPEG-2 encoder in Vegas Pro renders with the Low Delay flag turned off. If you're rendering with a different encoder, ensure Low Delay is turned off.*

## Rendering projects for Blu-ray Disc

You can burn Blu-ray Disc projects to BD recordable discs using the BDMV format:

- A 25 GB single-layer BD recordable disc can store approximately 3 hours, 42 minutes of AVC video (15 Mbps) or 2 hours, 15 minutes of MPEG-2 video (25 Mbps).
- A 50 GB dual-layer BD recordable disc can store approximately 7 hours, 25 minutes of AVC video (15 Mbps) or 4 hours, 31 minutes of MPEG-2 video (25 Mbps).

**Note:** *When you use* **Tools** > **Burn Disc** > **Blu-ray Disc** *in a stereoscopic 3D project, Vegas Pro will render a Blu-ray 3D Disc image file (.iso) for commercial BD-ROM preparation testing.*

*If your goal is the higher-end Blu-ray 3D™ format, Vegas Pro can prepare content in full HD per-eye format by rendering two separate files (using* **Left only** *and* **Right only** *modes), which can be read by an MVC encoder such as the Dualstream 3D encoder (http://www.sonycreativesoftware.com/blurayencoding) and authored using a tool such as Blu-print (http://www.sonycreativesoftware.com/bluprint).*

*For more information about working with stereoscopic 3D projects, see* *Stereoscopic 3D Editing on page 123**.*

### AC-3 audio (.ac3)

| Sample Rate | Bit Rate | Channels |
|---|---|---|
| 48,000 Hz | 192 Kbps (64 Kbps to 640 Kbps is supported) | Stereo |
| 48,000 Hz | 192 Kbps (64 Kbps to 640 Kbps is supported) | 5.1 surround |

### PCM audio (.wav or .w64)

| Sample Rate | Bit Depth | Channels | Compression |
|---|---|---|---|
| 48,000 Hz | 16 or 24 bit | Stereo | Uncompressed |
| 96,000 Hz | 16 or 24 bit | Stereo | Uncompressed |

### AVC video

If you're using Vegas Pro software, you can use the AVCHD rendering templates to render a compliant video file including 5.1 surround AC-3 audio.

| Template Name | Frame Size | Frame Rate | Aspect Ratio | Maximum Bit Rate |
|---|---|---|---|---|
| AVCHD NTSC 5.1 Surround | 1440x1080 | 29.970 fps | 16:9 | 40 Mbps |
| AVCHD PAL 5.1 Surround | 1440x1080 | 25 fps | 16:9 | 40 Mbps |

If you're rendering with a different application, the following settings will produce compliant AVC media.

| Frame Size | Frame Rate (fps) | Aspect Ratio | Maximum Bit Rate |
|---|---|---|---|
| 720x480 | 29.970 interlaced | 4:3 | 40 Mbps |

| Frame Size | Frame Rate (fps) | Aspect Ratio | Maximum Bit Rate |
|---|---|---|---|
| 720x480 | 29.970 interlaced | 16:9 | 40 Mbps |
| 720x576 | 25 interlaced | 4:3 | 40 Mbps |
| 720x576 | 25 interlaced | 16:9 | 40 Mbps |
| 1280x720 | 59.940 | 16:9 | 40 Mbps |
| 1280x720 | 50 | 16:9 | 40 Mbps |
| 1280x720 | 24.000 | 16:9 | 40 Mbps |
| 1280x720 | 23.976 | 16:9 | 40 Mbps |
| 1440x1080 | 29.970 interlaced | 16:9 | 40 Mbps |
| 1440x1080 | 25 interlaced | 16:9 | 40 Mbps |
| 1440x1080 | 24.000 | 16:9 | 40 Mbps |
| 1440x1080 | 23.976 | 16:9 | 40 Mbps |
| 1920x1080 | 29.970 interlaced | 16:9 | 40 Mbps |
| 1920x1080 | 25 interlaced | 16:9 | 40 Mbps |
| 1920x1080 | 24.000 | 16:9 | 40 Mbps |
| 1920x1080 | 23.976 | 16:9 | 40 Mbps |

### MPEG-2 video

If you're using Vegas Pro software, you can use the Blu-ray rendering templates to render your video stream. You'll need to render your audio stream separately according to the parameters listed in the AC-3 audio or PCM audio headings above.

| Template Name | Frame Size | Frame Rate (fps) | Aspect Ratio | Maximum Group of Pictures | Maximum Bit Rate |
|---|---|---|---|---|---|
| Blu-ray 1920x1080-24p, 25 Mbps video stream | 1920x1080 | 23.976 | 16:9 | 24 | 40 Mbps |
| Blu-ray 1920x1080-50i, 25 Mbps video stream | 1920x1080 | 25 | 16:9 | 25 | 40 Mbps |
| Blu-ray 1920x1080-60i, 25 Mbps video stream | 1920x1080 | 29.970 | 16:9 | 30 | 40 Mbps |
| Blu-ray 1440x1080-24p, 25 Mbps video stream | 1440x1080 | 23.976 | 16:9 | 24 | 40 Mbps |
| Blu-ray 1440x1080-50i, 25 Mbps video stream | 1440x1080 | 25 | 16:9 | 25 | 40 Mbps |
| Blu-ray 1440x1080-60i, 25 Mbps video stream | 1440x1080 | 29.970 | 16:9 | 30 | 40 Mbps |
| Blu-ray 1440x1080-24p, 8 Mbps video stream | 1440x1080 | 23.976 | 16:9 | 24 | 40 Mbps |
| Blu-ray 1440x1080-50i, 8 Mbps video stream | 1440x1080 | 25 | 16:9 | 25 | 40 Mbps |
| Blu-ray 1440x1080-60i, 8 Mbps video stream | 1440x1080 | 29.970 | 16:9 | 30 | 40 Mbps |

If you're rendering with a different application, the following settings will produce compliant MPEG-2 video stream.

| Frame Size | Frame Rate (fps) | Aspect Ratio | Maximum Group of Pictures | Maximum Bit Rate |
|---|---|---|---|---|
| 720x480 | 29.970 interlaced | 4:3 | 30 | 40 Mbps |
| 720x480 | 29.970 interlaced | 16:9 | 30 | 40 Mbps |
| 720x576 | 25 interlaced | 4:3 | 25 | 40 Mbps |
| 720x576 | 25 interlaced | 16:9 | 25 | 40 Mbps |
| 1280x720 | 59.940 | 16:9 | 60 | 40 Mbps |
| 1280x720 | 50 | 16:9 | 50 | 40 Mbps |
| 1280x720 | 24.000 | 16:9 | 24 | 40 Mbps |
| 1280x720 | 23.976 | 16:9 | 24 | 40 Mbps |

| Frame Size | Frame Rate (fps) | Aspect Ratio | Maximum Group of Pictures | Maximum Bit Rate |
|---|---|---|---|---|
| 1440x1080 | 29.970 interlaced | 16:9 | 30 | 40 Mbps |
| 1440x1080 | 25 interlaced | 16:9 | 25 | 40 Mbps |
| 1440x1080 | 24.000 | 16:9 | 24 | 40 Mbps |
| 1440x1080 | 23.976 | 16:9 | 24 | 40 Mbps |
| 1920x1080 | 29.970 interlaced | 16:9 | 30 | 40 Mbps |
| 1920x1080 | 25 interlaced | 16:9 | 25 | 40 Mbps |
| 1920x1080 | 24.000 | 16:9 | 24 | 40 Mbps |
| 1920x1080 | 23.976 | 16:9 | 24 | 40 Mbps |

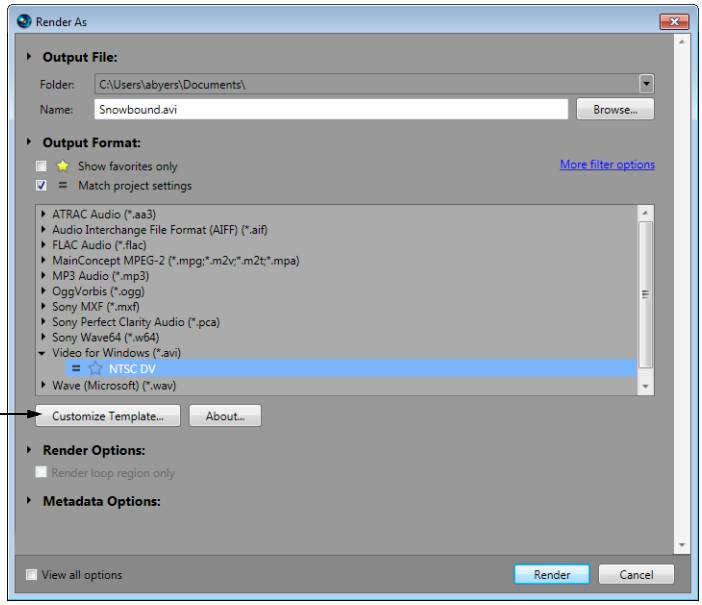
## Custom rendering templates

If the selected file type supports it, the Render As window allows you to create custom templates for saving files.

Some file formats include a **Project** tab in the Custom Template window that allows you to associate a **Video rendering quality** setting with a rendering template. Final rendering template settings override the **Full-resolution rendering quality** setting in the Project Properties window.

**Notes:**

- *Vegas Pro templates for rendering multichannel audio in .wav/.wav64, .avi, and .mxf formats may be visible in other Sony Creative Software Inc. applications that do not support multichannel audio. Using these templates in other applications will not produce the desired result and should be avoided.*
- *If you modify a template in the Custom Template window without saving it with a new name, the settings will be saved to disk as "Untitled."*




Click **Customize Template** to change control settings or create/delete a template.

### Creating or editing a template

1. Use the Render As dialog to specify a location and name for the file you want to save.
2. Select a template in the Output Format box and click the **Customize Template** button to open the Custom Template dialog.
3. Choose a template from the **Template** drop-down list, or enter a new name in the edit box.
   - Built-in presets cannot be edited.
   - When determining bit rates, 1K=1024.
4. Use the Custom Template dialog to set the template's properties.

**Note:** *For information about specific controls in each file type's Custom Template dialog, click the help button ( ).*

5. Click the **Save Template** button ( ).
6. Click **OK** to return to the Save As or Render As dialog.

### Deleting a template

1. Use the Render As dialog to specify a location and name for the file you want to save.
2. Select a template in the Output Format box and click the **Customize Template** button to open the Custom Template dialog.

3. Choose a template from the **Template** drop-down list.
4. Click the **Delete Template** button ( ).

> **Note:** *Built-in presets cannot be deleted.*

5. Click OK to return to the Save As or Render As dialog.

### Copying rendering templates between computers or user accounts

You can make your customized rendering templates available on another computer or user account by copying .sft2 files to the appropriate location in the new account or computer.

Rendering templates are stored in C:\Users\<username>\AppData\Roaming\Sony\Render Templates\<plug-in name>.

> **Notes:**
>
> - *The AppData folder is not visible unless the* **Show hidden files and folders** *radio button is selected on the* **View** *tab of the Windows Folder Options control panel.*
> - *You can find a plug-in's name by clicking the* **About** *button in the Render As dialog.*

To make a template available on another computer or user account, copy the .sft2 file to the same location in another account.

For example, to make JSmith's custom wave template available for the AJones user account in Windows 7, copy the appropriate .sft2 file from this folder:

C:\Users\JSmith\AppData\Roaming\Sony\Render Templates\wave

to this folder:

C:\Users\AJones\AppData\Roaming\Sony\Render Templates\wave

> **Tip:** *If you're copying templates from an older Sony Creative Software application, templates are saved as .sft files in the following folder: C:\Documents and Settings\<username>\Application Data\Sony\File Templates\<plug-in name>\<plug-in GUID>.*

## Rendering in real time

Real-time rendering is a playback mode that renders your project to .wav format. Real-time rendering allows you to include the output from an external input source such as an effects processor with your project. *For more information, see Using input busses with hardware-based effects on page 223.*

**Notes:**

- *When you start real-time rendering, any track that is armed for recording will be unarmed. You cannot arm a track for recording or start recording in real-time rendering mode.*
- *When rendering a project that does not use external audio hardware, real-time rendering and normal rendering will produce the same output. Real-time rendering will take longer to complete, allowing you to monitor the rendered file as it is created.*
- *If the metronome is enabled for playback, it will not be included in the rendered output. For more information, see Using the metronome on page 239.*

1. From the **File** menu, choose **Real-Time Render**.
2. Choose a drive and folder from the **Save in** drop-down list, or use the browse window to locate the folder where you want to save your file.

**Important:** *When using real-time rendering, render you project to a local hard drive. Rendering to a network folder or removable drive can result in gapping.*

3. Type a name in the **File name** box, or select a file in the browse window to replace an existing file.
4. Click **Save** to start rendering your project from the beginning of the timeline.

## Exporting a movie to a PSP™

If you want to render your project to Sony AVC/AAC format and transfer it to a USB-connected PSP™ (PlayStation® Portable) system, you can do this using the Vegas Pro Export to PSP™ feature.

**Notes:**

- *PSP firmware version 2.0 or higher is required to use this feature. To check your firmware version, choose* **Settings** > **System Settings** > **System Information** *on the PSP™. For the latest firmware, go to http://us.playstation.com (in the United States) or http://www.playstation.com (outside the United States).*
- *Full-screen and high-bit-rate rendering templates require the latest PSP™ firmware for playback.*
- *If you're using high-resolution video, choose* **Best** *from the* **Full-resolution rendering quality** *drop-down list on the Video tab of the Project Properties dialog before exporting your movie to prevent resizing artifacts.*

1. Click in the timeline to position your cursor on the frame you want to use to represent your movie. This image will be displayed as a thumbnail on the PSP™ navigation system.
2. Connect the USB cable and AC adapter to the PSP™ system and place it in USB mode.
3. From the **Tools** menu, choose **Export to PSP™ (PlayStation®Portable)**. The Export to PSP™ (PlayStation®Portable) dialog is displayed.

**Tip:** *If you want to render an AVC video without transferring to a PSP™, use the Render As dialog and choose* **Sony AVC/AAC (*.mp4)** *in the Output Format box. For more information, see Rendering a project on page 363.*

4. The **Title** box displays the title of your project from the **Summary** tab of the Project Properties dialog. This title will be displayed on the PSP™ system.

   Editing the title in the Export to PSP™ (PlayStation®Portable) dialog will also update the Project Properties dialog.
5. The **File path** box displays the folder and file name that will be used to render your movie.

   Click the **Refresh** button if you need to rescan the device.

6. Choose a setting from the **Template** drop-down list to specify the settings that will be used to save your file.

   You can choose to encode with QVGA, QVGA widescreen, PSP™ full-screen, or standard-definition NTSC frame aspect.

   - Both QVGA settings create 320x240 video, but the widescreen templates use anamorphic widescreen encoding, which is properly decoded on the PSP™ system.
   - The PSP™ full-screen templates create 480x270 video to match the PSP™ screen resolution.
   - The SD NTSC templates create 720x480 video to match a standard-definition NTSC screen.

**Tips:**

- *The settings for the selected template are displayed in the* **Description** *box.*
- *The 512 Kbps QVGA and PSP™ full-screen templates are useful when you want to minimize file size, and the 896- and 1128-Kbps templates will produce higher-quality video, especially in scenes with high-motion video.*

7. Select the **Render loop region only** check box if you only want to render a portion of your project. If the check box is cleared, the entire project will be rendered to a new file.
8. Select the **Stretch video to fill output frame size (do not letterbox)** check box if you want to reformat your video so it fills the output frame size listed in the **Description** box. When the check box is cleared, the current aspect ratio is maintained and black borders are added to fill the extra frame area (letterboxing). This option is useful when the desired output format does not match the frame aspect ratio of your project.
9. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for your rendered file. When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated. You can use this setting to proof your project on an unrotated display.
10. Click **OK**. Your movie file (<*file name*>.mp4) and thumbnail file (<*file name*>.thm) are created and transferred to the appropriate folder on the PSP™ system.

## Uploading a movie to YouTube

When you're done with your movie, you're probably going to want to share it with your friends and family as soon as possible.

**Important:** *This feature requires that you have a YouTube account. If you don't already have an account, you can go to http://www.youtube.com/signup to sign up.*

1. From the **File** menu, choose **Upload to YouTube**. The Upload to YouTube dialog is displayed.
2. Type your YouTube username and password in the **YouTube username** and **YouTube password** boxes.

**Note:** *If you have a Gmail address linked with your YouTube account, you can use your Gmail username and password to log in.*

3. Type a title to identify your video in the **Title** box.

   The information from the **Title** box of on the **Summary** tab of the Project Properties dialog is used by default.
4. Type a description of your movie in the **Description** box.

   The information from the **Comments** box on the **Summary** tab of the Project Properties dialog is used by default.
5. Choose a setting from the **Video category** drop-down list. The category you choose is used to classify videos on the YouTube site.
6. Type keywords you want to associate with your movie in the **Tags** box. Use words that relate to your movie and describe its content. These tags will be used when searching YouTube. You can use commas or spaces to separate multiple keywords.

**Note:** *If you are uploading a stereoscopic 3D project, Vegas Pro automatically adds the tags needed to enable 3D viewing on YouTube.*

7. Select the **Public** or **Private** radio button to set broadcast options for your movie. Public videos can be seen by any YouTube user; private videos can be seen only by members you specify.
8. Select the **Normal** or **Higher** radio button to set the video quality for your movie. The **Higher** setting creates better-looking video for broadband connections but will take longer to render.

   The estimated file size is displayed at the bottom of the dialog.
9. Select the **Render and upload loop region only** check box if you want to save only the portion of the project that is contained within the loop region. **Loop Playback** does not need to be selected for this option to work.
10. Click the **Upload** button to start uploading your movie to YouTube.

    After your movie has been uploaded, you can click the **Edit Video Info** button to display the My Account page in a browser window, where you can edit the information about your video, or click **Close** to return to the Vegas Pro timeline.

**Note:** *Videos you upload to YouTube are transcoded after uploading and are not immediately available. You can visit the My Videos page on the YouTube Web site to check the status of your uploaded videos.*

## Printing video to tape

Vegas Pro software provides two methods for printing your final movie to tape: you can print to tape directly from the Vegas Pro timeline, or you can use the Video Capture application to print an existing rendered file to DV tape.

### Printing video to tape from the timeline

You can print either a portion of your project or the entire video right from the project timeline to a camera or deck. Your project is examined, any complex portions are prerendered, and then printed to tape all in one action. *For more information, see Prerendering video on page 347.*

**Important:**

- *Prerendered files can require significant drive space. On the* **Video** *tab of the Project Properties dialog, select a* **Prerendered files folder** *on an a/v-capable drive with ample free space. DV requires approximately 228 MB per minute.*
- *HDMI print to tape is supported on the Blackmagic Design DeckLink HD Extreme/Intensity Pro/HD Extreme 3D, AJA Io Express, and AJA KONA LHi cards. Please note that AJA XENA cards are now branded as KONA cards. For more information, please see the AJA Web site at http://www.aja.com/products/kona/transition.php.*
- *For the latest information about supported hardware, please see our Web site at http://www.sonycreativesoftware.com/vegaspro/io#sdi.*

#### Printing to a DV device

1. If you want to print only a portion of your project, create a time selection that includes the section of your project.
2. From the **Tools** menu, choose **Print Video to Tape**. The Device Setup dialog is displayed.

3. Use the Device Setup dialog to configure your camera or deck:
   a. From the **Device type** drop-down list, choose **OHCI-Compliant IEEE 1394/DV**.
   b. From the **Video** drop-down list, choose the setting that matches your destination format.

> **Important:** *You'll need to choose a rendering template that inserts pulldown fields to create a standard DV file if your project properties are set to 24p or if you selected the* **Allow pulldown removal when opening 24p DV** *check box on the* **General** *tab of the Preferences dialog. Use the* **NTSC DV 24p (inserting 2-3-3-2 pulldown)** *template if you intend to bring the file back into the timeline as source material.*
>
> *If you cleared the* **Allow pulldown removal when opening 24p DV** *check box before adding your media and your project properties are not set to 24p, your 24p video is read as 29.97 fps interlaced video (60i), so you can choose whichever NTSC DV or PAL DV template suits your project requirements.*

   c. From the **Audio** drop-down list, choose the setting that matches your destination format.
   d. If necessary, drag the **Record engage delay** slider to specify the number of frames it takes your camera or deck to switch from Record Pause to Record mode. If you're missing frames from the beginning of your file after printing to tape, increase the setting. If you see duplicated frames at the beginning of your video, decrease the setting.
   e. Click the **Next** button. The Render Settings dialog is displayed.
4. Use the Render Settings dialog to choose the format you want to use to print your video to tape.
   a. Select the **Enable multichannel mapping** check box if you're working with multichannel source files and need to specify which channels to use in the stereo file when printing to tape. Click the **Channels** button to choose which channels you want to render.

      For example, if your video source contained 6-channel audio, you could route each channel's track to a separate bus. Then, when printing to tape, you could click the **Channels** button and choose which bus should be printed to tape.

      *For more information about rendering multichannel audio and setting up multichannel mapping, see Rendering multichannel audio files on page 366.*

> **Note:** *Multichannel audio is not supported when printing to a DV device.*

   b. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for your rendered file. *For more information, see Working with rotated projects on page 39.*

      When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated. You can use this setting to proof your project on an unrotated display.
   c. Select the **Render loop region only** check box if you want to print only the portion of your project that you selected in step 1.
   d. Select the **Prerender audio to proxy file** check box if you want to prerender the audio portion of your project before printing to tape.

      The **Prerendered files folder** box displays the path to the folder where prerendered files are saved. Video files are saved to this folder so that you don't need to rerender the project every time you view it.

      If you want to change the location of the folder, click the **Browse** button and choose a new location. Changing the setting here will update the setting on the **Video** tab of the Project Properties dialog.
   e. Click **Next**. The Leader and Trailer dialog is displayed.

5. Use the Leader and Trailer dialog to set up the data that will be printed before and after your project:
   a. Select the **Add test pattern leader** check box if you want to print a test pattern before your video.
   b. From the **Test pattern style** drop-down list, choose a test pattern type and video format.
   c. Type a value in the **Duration** box to determine the length of the test pattern.
   d. Select the **Play 1 kHz tone with test pattern** check box to add an audio test tone that will play along with the test pattern.
   e. Select the **Add black leader** check box and type a value in the **Duration** box if you want to print black frames before your video.
   f. Select the **Add black trailer** check box and type a value in the **Duration** box if you want to print black frames after your video.
   g. Click **Next**. The Device Control dialog is displayed.
6. Use the Device Control dialog to indicate whether Vegas Pro software will have control of your DV recorder and how you want to print to tape:

| Setting | Description |
|---|---|
| **Manual** | Select this radio button if the application is unable to obtain device control of your deck.<br>You will need to cue the tape and press the Record button on your deck before recording. |
| **Crash Recording** | Select this radio button if the application can perform basic device control of your deck.<br>You will need to cue the tape to the location where you want to begin printing. The device's timecode location is displayed in the **Device timecode** box.<br>When you click **Finish**, recording will begin automatically and will stop after reaching the end of the selection or project. |
| **Auto Edit** | Select this radio button if your deck supports Auto Edit/Insert Edit mode.<br>**Important:** *When using Auto Edit mode, use a striped tape to ensure continuous timecode over the portion of the tape where you plan to record.*<br>a. Select the **Preview only** check box if you want to preview your print-to-tape operation without engaging the deck's record head.<br>Use **Preview only** mode to double-check and adjust your **Start printing at** timecode setting as needed.<br>b. The **Start printing at** box displays the current device timecode location. You can cue the tape or type a value to indicate where you want to begin recording. The **End at** box displays the frame where recording will end (much like punch-in audio recording).<br>c. When you click **Next**, the Select Channels page is displayed.<br>d. On the Select Channels page, select a radio button to choose which channels you want to print to tape.<br>• **Write all rendered channels** Select this radio button to print video and all audio channels to tape.<br>• **Write only selected channels** Select this radio button if you want to choose which channels you want to print to tape. Select the check box for each channel you want to print. |

7. Click **Finish**. If you have not already prerendered, portions of your project that cannot be rendered and printed to tape in real time will be selectively prerendered.
   - If you're using **Manual** mode, a dialog will be displayed after rendering is finished. You can specify a delay time in the **Delay playback countdown timer** box and select the **Beep each second during countdown** check box if you want to count down before sending video to your device.
   - If you're using **Crash Recording** mode, your DV recorder will start and begin recording after rendering is finished.
   - If you're using **Auto Edit** mode, recording will begin and end automatically at the specified timecode positions.

**Printing to a tape deck connected to an SDI card**

1. If you want to print only a portion of your project, create a time selection that includes the section of your project.
2. From the **Tools** menu, choose **Print Video to Tape**. The Device Setup dialog is displayed.
3. Use the Device Setup dialog to configure your camera or deck:
   a. From the **Device type** drop-down list, choose **AJA Video Device** or **Blackmagic Design DeckLink**.
   b. From the **Output** drop-down list, choose **SDI** or **HDMI** (if your devices supports HDMI output).
   c. From the **Video** drop-down list, choose the setting that matches your destination format.

> **Important:** *You'll need to choose a rendering template that inserts pulldown fields to create a standard DV file if your project properties are set to 24p or if you selected the* **Allow pulldown removal when opening 24p DV** *check box on the* **General** *tab of the Preferences dialog. Use the* **NTSC DV 24p (inserting 2-3-3-2 pulldown)** *template if you intend to bring the file back into the timeline as source material.*
>
> *If you cleared the* **Allow pulldown removal when opening 24p DV** *check box before adding your media and your project properties are not set to 24p, your 24p video is read as 29.97 fps interlaced video (60i), so you can choose whichever NTSC DV or PAL DV template suits your project requirements.*

   d. From the **Audio** drop-down list, choose the setting that matches your destination format.
   e. Select the **Use progressive segmented frame (psf) video formats** check box if your project properties are set to a progressive-scan format and you want to preview on a device that stores and transfers progressive-scan frames by dividing fields (AJA SDI cards only).
   f. Select the **Use 10-bit encoding** check box if you want to print 10-bit source material for increased color resolution. Source material with gradients in the background can benefit from 10-bit encoding.

      When you use 10-bit video in your project, choose **32-bit floating point (video levels)** from the **Pixel format** setting on the **Video** tab of the Project Properties tab.
   g. If necessary, drag the **Record engage delay** control to specify the number of frames it takes your camera or deck to switch from Record Pause to Record mode. If you're missing frames from the beginning of your file after printing to tape, increase the setting. If you see duplicated frames at the beginning of your video, decrease the setting.
   h. Choose a setting from the **Genlock** drop-down list if you want to synchronize your video output with a reference signal (AJA SDI cards only).

| Setting | Description |
|---|---|
| **Video In** | Synchronizes to the SDI input when **SDI** is selected in the **Output** drop-down list or synchronizes to the HDMI output when **HDMI** is selected in the **Output** drop-down list. |
| **Ref In** | Synchronizes to an external reference input signal. |
| **Free Run** | Ignores all input signals and uses internal timing. |

   i. Click the **Next** button. The Render Settings dialog is displayed.

4. Use the Render Settings dialog to choose the format you want to use to print your video to tape.
   a. Select the **Enable multichannel mapping** check box if you want to render a file with multiple audio channels.

      *For more information about rendering multichannel audio and setting up multichannel mapping, see Rendering multichannel audio files on page 366.*

   b. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for your rendered file. *For more information, see Working with rotated projects on page 39.*

      When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated. You can use this setting to proof your project on an unrotated display.

   c. Select the **Render loop region only** check box if you want to print only the portion of your project that you selected in step 1.

   d. Select the **Prerender audio to proxy file** check box if you want to prerender the audio portion of your project before printing to tape.

      The **Prerendered files folder** box displays the path to the folder where prerendered files are saved. Video files are saved to this folder so that you don't need to rerender the project every time you view it.

      If you want to change the location of the folder, click the **Browse** button and choose a new location. Changing the setting here will update the setting on the **Video** tab of the Project Properties dialog.

   e. Click **Next**. The Leader and Trailer dialog is displayed.

5. Use the Leader and Trailer dialog to set up the data that will be printed before and after your project:
   a. Select the **Add test pattern leader** check box if you want to print a test pattern before your video.

   b. From the **Test pattern style** drop-down list, choose a test pattern type and video format.

   c. Type a value in the **Duration** box to determine the length of the test pattern.

   d. Select the **Play 1 kHz tone with test pattern** check box to add an audio test tone that will play along with the test pattern.

   e. Select the **Add black leader** check box and type a value in the **Duration** box if you want to print black frames before your video.

   f. Select the **Add black trailer** check box and type a value in the **Duration** box if you want to print black frames after your video.

   g. Click **Next**. The Device Control dialog is displayed.

6. Use the Device Control dialog to indicate whether Vegas Pro software will have control of your deck:

| Setting | Description |
|---|---|
| **Manual** | Select this radio button if the application is unable to obtain device control of your deck.<br>You will need to cue the tape and press the Record button on your deck before recording. |
| **Crash Recording** | Select this radio button if the application can perform basic device control of your deck.<br>You will need to cue the tape to the location where you want to begin printing. The device's timecode location is displayed in the **Device timecode** box.<br>When you click **Finish**, recording will begin automatically and will stop after reaching the end of the selection or project. |
| **Auto Edit** | Select this radio button if your deck supports Auto Edit/Insert Edit mode.<br>**Important:** *When using Auto Edit mode, use a striped tape to ensure continuous timecode over the portion of the tape where you plan to record.*<br>**a.** Select the **Preview only** check box if you want to preview your print-to-tape operation without engaging the deck's record head.<br>Use **Preview only** mode to double-check and adjust your **Start printing at** timecode setting as needed.<br>**b.** The **Start printing at** box displays the current device timecode location. You can cue the tape or type a value to indicate where you want to begin recording. The **End at** box displays the frame where recording will end (much like punch-in audio recording).<br>**c.** When you click **Next**, the Select Channels page is displayed.<br>**d.** On the Select Channels page, select a radio button to choose which channels you want to print to tape.<br>• **Write all rendered channels** Select this radio button to print video and all audio channels to tape.<br>• **Write only selected channels** Select this radio button if you want to choose which channels you want to print to tape. Select the check box for each channel you want to print. |

7. Click **Finish**. If you have not already prerendered, portions of your project that cannot be rendered and printed to tape in real time will be selectively prerendered.
   - If you're using **Manual** mode, a dialog will be displayed after rendering is finished. You can enter a delay time in the **Delay** box and select the **Beep** check box if you want to count down before sending video to your deck.
   - If you're using **Crash Recording** mode, your deck will begin recording after rendering is finished.
   - If you're using **Auto Edit** mode, your deck will begin recording after rendering is finished and recording will begin and end automatically at the specified timecode positions.

## Printing HDV video to tape

From the **Tools** menu, choose **Print Video to HDV Tape** to print your project to an HDV camera or deck.

### Printing to HDV tape from the timeline

Use this procedure when you're creating an HDV project on the timeline and need to render a MPEG2 transport stream and print it to HDV tape.

1. Load your HDV project. *For more information, see Working in HDV format on page 279*.
2. If you want to print only a portion of your project, create a time selection that includes the section of your project.
3. From the **Tools** menu, choose **Print Video to HDV Tape**. The HDV Print to Tape - Device page is displayed.
4. Choose your HDV camera or deck from the **Device** drop-down list.
5. Click **Next**. The HDV Print to Tape - Select Format/File page is displayed.

6. Choose render settings:
   a. Select the **Render format** radio button.
   b. In the **File path** box, type the path to the file you want to render, or click the **Browse** button to browse to the folder you want to use and then type a file name.
   c. From the **Template** drop-down list, choose the setting that matches your destination format. This list will include only formats that are supported by the selected device.

      Information about the selected rendering template is displayed in the **Description** box.
   d. Select the **Render loop region only** check box if you want to print only the portion of your project that you selected in step 2.
   e. Select the **Delete file after print** check box if you want to delete the rendered file after the print-to-tape operation is finished.
   f. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for your rendered file. *For more information, see* *Working with rotated projects on page 39*.

      When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated. You can use this setting to proof your project on an unrotated display.
7. Click **Next**. The HDV Print to Tape - Device Control page is displayed.
8. Use the Device Control dialog to indicate whether Vegas Pro software will have control of your HDV recorder and how you want to print to tape:
   - Select **Manual** if your HDV device is not OHCI-compliant or if the application is unable to obtain device control of your HDV recorder. You will need to cue the tape and press the Record button on your HDV recorder before recording.
   - Select **Crash Recording** if you are using an OHCI-compliant IEEE-1394 HDV device and the application is able to obtain device control of your HDV recorder.

     You will need to cue the tape to the location where you want to begin printing. The device's timecode location is displayed in the **Device timecode** box.

     When you click **Finish,** recording will begin automatically and will stop after reaching the end of the selection or project.
9. Click **Finish**. Your project will be rendered to the file you specified in step 6.
   - If you're using **Manual** mode, a dialog will be displayed after rendering is finished. You can specify a delay time in the **Delay playback countdown timer** box and select the **Beep each second during countdown** check box if you want to count down before sending video to your device.
   - If you're using **Crash Recording** mode, your HDV recorder will start and begin recording after rendering is finished.

#### Printing a rendered file to HDV tape

Use this procedure when you have a rendered MPEG-2 transport stream that you want to print to HDV tape.

**Important:** *If you are printing a rendered file to HDV tape, the file must precisely conform to the target HDV device and file type requirements, or the print-to-tape operation will fail. Rendering using the provided HDV MPEG-2 render templates—unmodified in any way—is required to successfully print to HDV tape.*

1. Load your HDV project. *For more information, see* *Working in HDV format on page 279*.
2. If you want to print only a portion of your project, create a time selection that includes the section of your project.
3. From the **Tools** menu, choose **Print Video to HDV Tape**. The HDV Print to Tape - Device page is displayed.
4. Choose your HDV camera or deck from the **Device** drop-down list.
5. Click **Next**. The HDV Print to Tape - Select Format/File page is displayed.
6. Choose the file you want to print:
   a. Select the **Use an existing file** radio button.
   b. In the **File path** box, type the path to the file you want to print, or click the **Browse** button to choose the file you want to print.
7. Click **Next**. The HDV Print to Tape - Device Control page is displayed.

8. Use the Device Control dialog to indicate whether Vegas Pro software will have control of your HDV recorder and how you want to print to tape:
   - Select **Manual** if your HDV device is not OHCI-compliant or if the application is unable to obtain device control of your HDV recorder. You will need to cue the tape and press the Record button on your HDV recorder before recording.
   - Select **Crash Recording** if you are using an OHCI-compliant IEEE-1394 HDV device and the application is able to obtain device control of your HDV recorder.

     You will need to cue the tape to the location where you want to begin printing. The device's timecode location is displayed in the **Device timecode** box.

     When you click **Finish,** recording will begin automatically and will stop after reaching the end of the selection or project.
9. Click **Finish**.
   - If you're using **Manual** mode, a dialog will be displayed before printing begins. You can specify a delay time in the **Delay playback countdown timer** box and select the **Beep each second during countdown** check box if you want to count down before sending video to your device.
   - If you're using **Crash Recording** mode, your HDV recorder will start and begin recording after you click the **Finish** button.

### Printing to tape using Video Capture

1. If you have not already done so, connect your video camera to your video capture card using the cable provided with the card.
2. In the Project Media window, click the **Capture Video** button ( ). The Video Capture application starts.

> **Note:** *If your video camera is properly connected, the Video Preview window in the center of the application area should display "Device connected."*

3. Follow the instructions for printing to tape provided in the Video Capture online help. To access online help, click the **Help** menu within the Video Capture application, and choose **Contents and Index**. The Video Capture online help file opens.

Chapter 21

# Burning Discs

You can create several types of discs to archive and distribute your project:

- Track-at-once (TAO) CDs can be burned in multiple sessions over a period of time. Before you can use a TAO disc in an audio CD player, however, you must close the session. TAO CDs are convenient for sharing your projects and testing your mix, but are generally not acceptable as masters for duplication.
- Disc-at-once (DAO or Red Book) CDs are burned in a single session. Use DAO burning when creating a master disc for replication.
- Blu-ray Discs can be played in a Blu-ray Disc player or on a computer with a Blu-ray Disc drive.
- DVDs can be played in a DVD player or on a computer with a DVD drive.

## Understanding track-at-once and disc-at-once CD burning

Two ways are provided for recording audio to a CD-R disc: track-at-once and disc-at-once.

### Track-at-once

Track-at-once writing records individual tracks to the disc and results in a partially recorded disc. However, the CD-R disc remains unplayable on most systems until you close the disc. The advantage of track-at-once writing is that you can record tracks onto the disc as you finish them versus waiting until you have finished your whole album. Track-at-once writing burns the entire project as a single track.

### Disc-at-once (Single Session or Red Book)

Disc-at-once writing is the most common burning method in the music industry. This writing mode is used when creating a master disc to be sent to a disc manufacturer for mass replication. Disc-at-once works just as it sounds. Multiple tracks of audio are written to the CD in one recording session.

## Understanding tracks and indices

You are ready to burn a CD. If you plan to use track-at-once to record a single track, you can proceed right on to writing the entire project to a CD. However, you are more likely to set up tracks—and perhaps indices—within your project and burn several tracks at once.

**Tracks** distinguish songs in the project and have a starting and ending point. Tracks are used to indicate to the CD-R device where to mark the beginning and ending of a track during the writing process.

**Indices** are single markers that subdivide a track. Indices are useful for navigating to specific areas within a track. For example, a sound effects CD may have one track of breaking glass. The track is then indexed to allow navigation to a specific glass-breaking effect within the track. However, be aware that not all CD players allow navigation to indices.

Tracks and indices are identified in a **track list**, which is a chronological text list of all tracks and indices defined in the audio CD project.

## Setting up to burn audio CDs

You can set the project properties and adjust preferences to better accommodate writing audio CDs. The ruler and time display are set up for you automatically.

### Viewing the ruler and time display

The ruler and time display are automatically changed to audio CD time for you when you mark CD tracks in a project.

Audio CD time formats are as follows:

| Display | Format |
|---|---|
| Ruler | hh:mm:ss (hours:minutes:seconds) or<br>hh:mm:ss:ff (hours:minutes:seconds:frames, with fps=75) when zoomed in tightly |
| Time display | tt+mm:ss:ff (track number +/- minutes:seconds:frames, with fps=75) |

### Setting project properties

Click the **Properties** button ( ) to access project properties. On the **Audio CD** tab, you can set the Universal Product Code/Media Catalog Number (UPC/MCN) or set the number for the first track on the CD. *For more information, see Audio CD tab on page 408.*

### Setting preferences

From the **Options** menu, choose **Preferences** to access the Preferences dialog. On the **CD Settings** tab, you can set several options related to your CD/DVD drive(s) and CD burning. *For more information, see CD Settings tab on page 429.*

You can also enter the number of seconds added between tracks when adding Project Media window files as CD tracks. In the same Preferences dialog, click the **Editing** tab, and enter a value in the **Default time between CD tracks** box.

Finally, you may want to turn off the **Quantize to Frames** command in the **Options** menu. When quantizing to frames is active, your edits are limited to the starting edge of frame boundaries. In a CD layout project, you can turn this feature off to allow greater precision in editing and track placement. *For more information, see Quantizing to frames on page 102.*

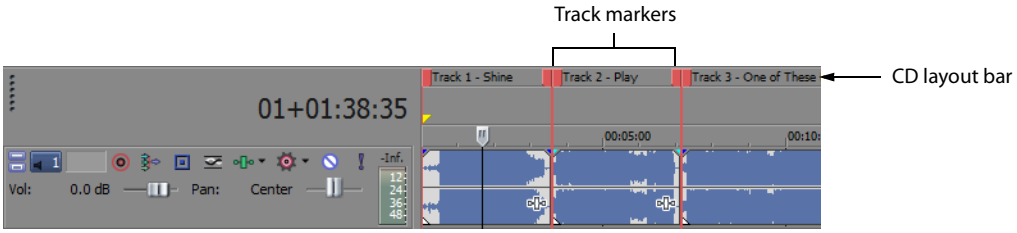
## Importing CD Architect files

You can use Vegas Pro software to open projects created in CD Architect™ software.

1. From the **File** menu, choose **Open**. The Open dialog appears.
2. Browse to the location of the project file.
3. In the **Files of type** drop-down list, select **CD Architect 4 Project Files (.cdp)**.
4. Select the file.
5. Click **Open**.

## Creating audio CD layout projects

Several ways are provided to create an audio CD layout project. If you have a set of audio files you wish to burn to a CD, you can add the files as tracks to a new audio CD layout project. Or, if you want to burn an audio CD from an existing project, you can mark the tracks in your project either automatically or manually.

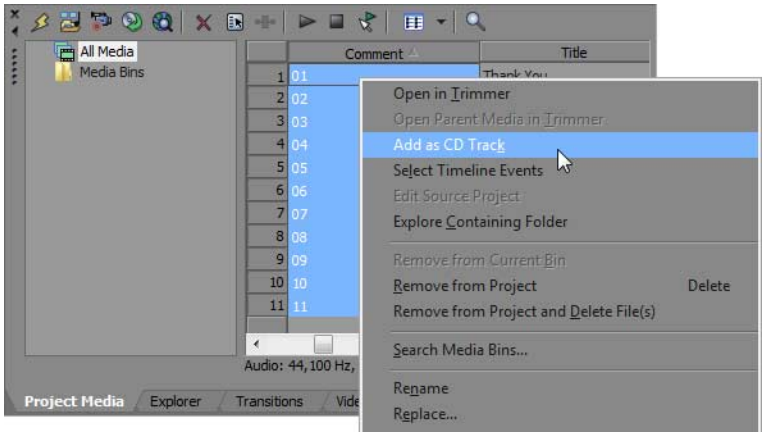


### Adding media as CD tracks to a new project

You have a collection of completed audio files that you want to write to a CD. An audio CD layout project can quickly be assembled from sound files in the Project Media window. You can add the tracks one at a time, or use the Project Media window to sort them into track order and add them all at once.

1. Create a new project.
2. Add all the media to be included in the project to the Project Media window. *For more information, see Using the Project Media window on page 42.*
3. To add all tracks at once, use the following steps to sort the files into track order:
   - In the Project Media window, click the arrow on the **Views** button ( ) and choose **Detailed** from the menu. The Project Media window changes to Detailed view.
   - In the **Comment** column, enter the track number for each media file (01, 02, etc.).
   - Click the **Comment** column header to sort the list into track order.
   - Select the sorted files in the Project Media window.
4. Right-click a media file (or the selected media files) and choose **Add as CD Track** from the shortcut menu.

   The files are added to a new track and the audio CD tracks are marked on the CD layout bar. The name of the media file is used to name each track. If necessary, you can edit the information for the new audio CD tracks using the markers on the CD layout bar or using the Edit Details window. *For more information, see Working with tracks and indices on page 391.*




### Marking tracks in an existing project

Once you have laid out your audio project with the appropriate pauses, you can mark tracks and indices either automatically or manually.

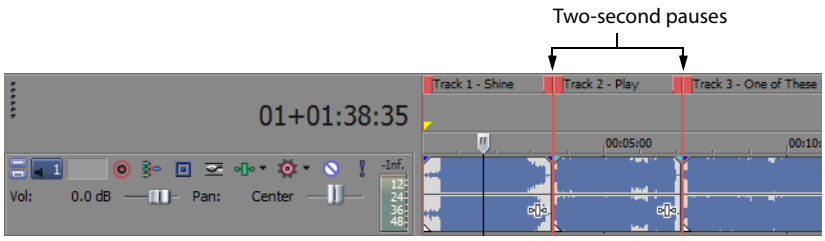
**Note:** *In DAO CD burning, Vegas Pro software burns from the beginning of the timeline to the last track marker, regardless of the location of the first track marker. Material before the first marker is included as a hidden track on the disc (if your drive supports burning this material).*

### Adding pauses

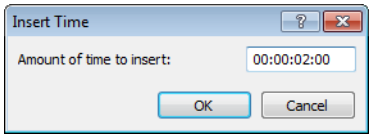
Each audio CD track in your project should have a two-second pause following it. This default setting is based on the Red Book specification for audio CDs. The exception to this standard is a continuous recording, such as a live concert CD. For a continuous recording, you can omit the pauses after tracks for continuous playback. *For more information, see Red Book specification on page 469.*

> **Note:** *The Red Book specification also requires a two-second pause at the beginning of an audio CD. If the first track in your project begins before the two-second mark, a ruler is added offset to ensure the project begins with the required two-second pause.*

If you use the **Add as CD Track** command to add tracks from the Project Media window, the appropriate pauses are added automatically. However, if you are laying out your project manually, you must create these pauses between audio CD tracks.




1. Position the cursor where you want to insert the pause.
2. From the **Insert** menu, choose **Time**. The Insert Time dialog is displayed.




3. Enter two seconds in the **Amount of time to insert** box.
4. Click **OK**. Two seconds are inserted in the timeline at the cursor position.

### Marking tracks automatically

Vegas Pro software can examine the events in your project and mark the audio CD tracks for you. Once the tracks are marked, you can adjust them manually if necessary. *For more information, see Moving track and index markers on page 391.*

1. Lay out your project with two-second pauses between tracks.
2. From the **Tools** menu, choose **Lay Out Audio CD from Events**.

The new audio CD track markers appear on the CD layout bar above the timeline. The name of the media file for each event is used to name the tracks.

### Marking tracks manually

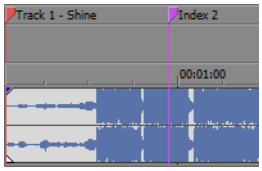
You can make a time selection and then mark that selection as an audio CD track.

1. Make a time selection that includes the audio for the new track.
2. From the **Insert** menu, choose **Audio CD Track Region**. The markers for the new audio CD track appear on the CD layout bar.

### Marking indices

You can create an index marker in much the same way as you create track markers.

1. Position the cursor where you want the index mark to appear.
2. From the **Insert** menu, choose **Audio CD Track Index**. The new index marker appears on the CD layout bar.




## Working with tracks and indices

Once you have marked your tracks and indices, you can edit, move, rename, or delete them as needed.

### Navigating to and selecting tracks and indices

Several shortcuts are provided for navigating to and selecting audio CD tracks on the CD layout bar.

- Double-click a track marker to select the track.
- Press . (period) to jump the cursor to the next track or index marker.
- Press , (comma) to jump the cursor to the previous track or index marker.
- Press Ctrl+. (period) to jump the cursor to the next track marker (index markers are skipped).
- Press Ctrl+, (comma) to jump the cursor to the previous track marker (index markers are skipped).
- Add Shift to any of these keystrokes to select rather than jump. For example, press Ctrl+Shift+. (period) to select from the cursor position to the next track marker.

The shortcut keystrokes can be used to jump the cursor while working on a project or during playback.

### Moving track and index markers

Track and index markers function just like markers and regions in Vegas Pro software. (*For more information, see Adding project markers and regions on page 93.*) You can drag a track or index marker to move it along the CD layout bar. Alternately, you can use the Edit Details window to make precise adjustments.

> **Tip:** *Move both the starting and ending markers for a track by pressing Alt and dragging either of the markers.*

### Renaming track and index markers

1. Right-click a marker and choose **Rename** from the shortcut menu that appears.
2. Type a new name for the marker and press Enter.

### Deleting track and index markers

You can delete a single track or index marker by right-clicking it and choosing **Delete** from the shortcut menu. To delete all markers at once, right-click the CD layout bar and choose **Delete All** from the shortcut menu.

### Editing markers using the Edit Details window

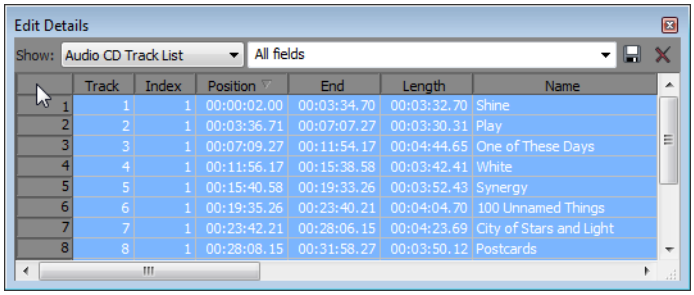
The Edit Details window provides a way to adjust the settings for a track or index.

1. From the **View** menu, choose **Edit Details**. The Edit Details window displays.
2. From the **Show** drop-down list, choose **Audio CD Track List**. The track settings display.
3. Double-click a setting to edit it:
   - In the **Position** column, adjust the track starting position or index position.
   - In the **End** column, adjust the track ending position.
   - In the **Length** column, adjust the track length.
   - in the **Name** column, enter the name of the track or index.
   - In the **Prot** column, select the check box to apply copy protection to the track.
   - In the **Emph** column, select the check box to enable a simple noise reduction process that is implemented by a CD player. *For more information, see Emphasis on page 465.*
   - In the **ISRC** column, enter the ISRC number for the track (if used).

### Copying a track list from the Edit Details window

You can use the Edit Details window to copy your track list and paste it into another application.

1. Click the gray box in the upper-left corner of the Edit Details window to select all the cells.




| | Track | Index | Position | End | Length | Name |
|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 00:00:02.00 | 00:03:34.70 | 00:03:32.70 | Shine |
| 2 | 2 | 1 | 00:03:36.71 | 00:07:07.27 | 00:03:30.31 | Play |
| 3 | 3 | 1 | 00:07:09.27 | 00:11:54.17 | 00:04:44.65 | One of These Days |
| 4 | 4 | 1 | 00:11:56.17 | 00:15:38.58 | 00:03:42.41 | White |
| 5 | 5 | 1 | 00:15:40.58 | 00:19:33.26 | 00:03:52.43 | Synergy |
| 6 | 6 | 1 | 00:19:35.26 | 00:23:40.21 | 00:04:04.70 | 100 Unnamed Things |
| 7 | 7 | 1 | 00:23:42.21 | 00:28:06.15 | 00:04:23.69 | City of Stars and Light |
| 8 | 8 | 1 | 00:28:08.15 | 00:31:58.27 | 00:03:50.12 | Postcards |

2. Press Ctrl+C to copy the cells.
3. Switch to another application and paste the information into a document or spreadsheet.

## Burning audio CDs

You can burn either single tracks (track-at-once) or the entire disc (disc-at-once).

### Burning single tracks (track-at-once)

You can burn your Vegas Pro project as a single track (track-at-once). Once you have burned all your tracks to the CD, you must close the disc before it can be played.

#### Burning a track-at-once CD

1. From the **Tools** menu, choose **Burn Disc**, and choose **Track-at-Once Audio CD** from the submenu. The Burn Track-at-Once Audio CD dialog displays the length of the current file and the amount of time remaining on the disc in your CD recorder.
2. Choose a setting from the **Action** drop-down list:
   - **Burn audio** begins recording audio to your CD when you click the **Start** button. You will need to close the disc before it can be played in an audio CD player.
   - **Test, then burn audio** performs a test to determine whether your files can be written to the CD recorder without encountering buffer underruns. Recording begins after the test if it is successful.
   - **Test only** performs a test to determine whether your files can be written to the CD without encountering buffer underruns. No audio is recorded to the CD.
   - **Close disc** closes your disc without adding any audio when you click the **Start** button. Closing a disc allows your files to be played on an audio CD player.
   - **Erase RW disc** erases your rewritable CD when you click the **Start** button.
3. Select your burning options:
   - **Buffer underrun protection:** Select this check box if your CD recorder supports buffer underrun protection. Buffer underrun protection allows a CD recorder to stop and resume burning.
   - **Erase RW disc before burning**: If you're using a rewritable CD, select this check box to erase the CD before you begin burning.
   - **Close disc when done burning**: Select this check box to close the CD after burning. Closing a disc allows your files to be played on an audio CD player.
   - **Eject disc when done**: Select this check box to eject the CD automatically when burning has completed.
   - **Burn selection only**: Select this check box to burn only the audio within the loop region.
4. From the **Drive** drop-down list, choose the CD drive that you want to use to burn your CD.
5. From the **Speed** drop-down list, choose the speed at which you want to burn. **Max** will use your drive's fastest possible speed; decrease the setting if you have difficulty burning.
6. Click the **Start** button.

> **Warning:** *Clicking the* **Cancel** *button after the disc-writing process has begun will render your disc unusable.*

7. When the writing process is complete, a confirmation message displays. Click **OK** to clear the message.

#### Closing a track-at-once CD

1. From the **Tools** menu, choose **Burn Disc**, and choose **Track-at-Once Audio CD** from the submenu. The Create CD dialog appears.
2. Click the **Close Disc** button.
3. When the disc is closed, a confirmation message displays. Click **OK** to clear the message.

### Burning a disc (disc-at-once)

1. From the **Tools** menu, choose **Burn Disc**, and choose **Disc-at-Once Audio CD** from the submenu. The Burn Disc-at-Once Audio CD dialog appears.
2. From the **Drive** drop-down list, use the CD drive that you want to use to burn your CD.
3. From the **Speed** drop-down list, choose the speed at which you want to burn. Max will use your drive's fastest possible speed; decrease the setting to prevent the possibility of buffer underruns.
4. Select the **Buffer underrun protection** check box if your CD recorder supports buffer underrun protection. Buffer underrun protection allows a CD recorder to stop and resume burning.

> **Note:** *Buffer underrun protection can create a disc that can be played in CD players, but may contain a bit error where burning stopped and restarted. Consider clearing this check box when creating a premaster disc.*

5. Choose a radio button in the **Burn mode** box:
   - **Burn CDs** begins recording audio to your CD immediately.
   - **Test first, then burn CDs** performs a test to determine whether your files can be written to the CD recorder without encountering buffer underruns. No audio is recorded to the CD during the test, and recording begins after the test if it is successful.
   - **Test only (do not burn CDs)** performs a test to determine whether your files can be written to the CD recorder without encountering buffer underruns. No audio is recorded to the CD.
6. Select the **Render temporary image before burning** check box if you want to render your CD project to a temporary file before recording. Prerendering can prevent buffer underruns if you have a complex project that cannot be rendered and burned in real time.

> **Note:** *The rendered temporary file will remain until you modify your project or exit. If an image file exists when you open the Burn Disc-at-Once Audio CD dialog, the check box is displayed as* **Use existing rendered temporary image**.

7. Select the **Automatically erase rewritable discs** check box if you're burning to rewritable media and want to erase the disc before burning.
8. Select the **Eject when done** check box if you want the CD to eject automatically when burning has completed.
9. Click **OK** to start burning.

## Burning a Blu-ray Disc

From the **Tools** menu, choose **Burn Disc** and choose **Blu-ray Disc** from the submenu to render your project and burn it to a Blu-ray Disc. Stereoscopic 3D projects can be rendered to a Blu-ray 3D Disc image file (.iso) for commercial BD-ROM preparation testing.

The rendered project can be played in a Blu-ray Disc player or on any computer with a Blu-ray Disc drive.

Vegas Pro burns Blu-ray BDMV format to BD-R and BD-RE recordable media.

**Tips:**

- *A 25 GB single-layer BD recordable disc can store approximately 3 hours, 42 minutes of AVC video or 2 hours, 15 minutes of MPEG-2 video (25 Mbps).*
- *A 50 GB dual-layer BD recordable disc can store approximately 7 hours, 25 minutes of AVC video (15 Mbps) or 4 hours, 31 minutes of MPEG-2 video (25 Mbps).*
- *You can store large amounts of standard-definition MPEG-2 video on a BD disc.*
- *You can create your own rendering templates if you need to adjust the bit rates. For more information, see Custom rendering templates on page 374.*

1. From the **Tools** menu, choose **Burn Disc** and choose **Blu-ray Disc** from the submenu. The Burn Blu-ray Disc dialog is displayed.
2. Select a radio button to choose what you want to do:
   - **Render image and burn**: renders your current project as a Blu-ray compliant file and burns it to disc.
   - **Render image only**: renders your current project as a Blu-ray compliant file that you can burn at a later time.
   - **Burn existing image file**: burns an already-rendered file to Blu-ray Disc.
3. If you selected the **Render image and burn** or **Render image only** radio button, choose your rendering settings:

**Tip:** *For more information about the media settings required to create compliant media files, see Rendering projects for Blu-ray Disc on page 371 .*

   a. Choose a setting from the **Video format** drop-down list to indicate whether you want to burn AVC or MPEG-2 video.
   b. Choose a setting from the **Video template** drop-down list to specify the parameters that should be used for rendering your video stream.

      Video for Blu-ray Discs can use MPEG-2 or AVC encoding. 3D Blu-ray Disc image files use MVC encoding:

      - The Vegas Pro Blu-ray MPEG-2 video templates have an average bit rate of 25 Mbps.
      - The Vegas Pro Blu-ray AVC video templates have an average bit rate of 15 Mbps.
      - The Vegas Pro Blu-ray MVC video templates for stereoscopic 3D projects have an average bit rate of 10 Mbps.
   c. Choose a setting from the **Audio format** drop-down list to indicate whether you want to burn AC-3 or wave (PCM) audio.
   d. Choose a setting from the **Audio template** drop-down list to specify the parameters that should be used for rendering your audio stream.

      AC-3 audio for Blu-ray Discs uses Dolby Digital 2.0- or 5.1-channel encoding at 192 Kbps or 448 Kbps respectively.

      Wave64 (PCM) audio for Blu-ray Discs can use any of the following formats:

      - 48 kHz, 16 or 24-bit, stereo or 5.1 surround (available only for 5.1 surround projects)
      - 96 kHz, 16 or 24-bit, stereo or 5.1 surround (available only for 5.1 surround projects)
   e. Select the **Render loop region only** check box if you want to use only a portion of your project. If the check box is cleared, the entire project will be rendered and saved to the disc.
   f. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for your rendered file.

      When the check box is cleared, the media is rotated according to its Media Properties setting, but the project itself is unrotated. You can use this setting to proof your project on an unrotated display. *For more information, see Working with rotated projects on page 39.*
   g. Select the **Insert chapter points at markers** check box if you want to use markers from the timeline as chapter points in your rendered file.

h. Select the **Stretch video to fill output frame** check box if you want to reformat your video so it fills the output frame size listed in the **Description** box. When the check box is cleared, the current aspect ratio is maintained, an black borders are added to fill the extra frame area (letterbox). This option is useful when the desired output format does not match the frame aspect ratio of your project.

4. If you selected the **Render image and burn** or **Render image only** radio button, the **File path** box displays the folder and file that will be used to render your project.

   If you selected the **Burn existing image file** radio button, type the path to the file you want to burn in the **File path** box (or click the **Browse** button to locate the file).

5. Select recording options for your Blu-ray drive:
   a. Choose a drive from the **Burn drive** drop-down list to specify the drive you want to use.
   b. From the **Burn speed** drop-down list, choose the speed at which you want to record. **Max** will record using the fastest speed possible with your drive; decrease the speed if you have difficulty recording.
   c. Select the **Eject when done** check box if you want to eject the disc automatically when burning has completed.
6. Click **OK** to start rendering your image file and burning your disc.

## Burning a DVD

You can render your project and burn it to the DVD. The rendered project can be played in a DVD player or on any computer with a DVD drive.

1. From the **Tools** menu, choose **Burn Disc**, and then choose **DVD** from the submenu to display the Burn DVD dialog.
2. Choose a setting from the **Video format** drop-down list to specify the parameters that should be used for rendering your video stream.

   The **Audio format** box displays the parameters that should be used for rendering your audio stream.
3. Select recording options for your DVD burner:
   a. Choose a drive from the **Burn drive** drop-down list to specify the drive you want to use.
   b. From the **Burn speed** drop-down list, choose the speed at which you want to record. **Max** will record using the fastest speed possible with your drive; decrease the speed if you have difficulty recording.
   c. Select the **Eject when done** check box if you want to eject the disc automatically when burning has completed.
4. Click **OK** to start rendering your image file and burning your disc.

Chapter 22

# Using Scripting

Using the scripting features, Vegas® Pro software becomes an even more powerful and flexible tool. You can use scripting to streamline repetitive tasks, integrate with external applications, and implement customized features.

To use scripting, you'll need to install the Microsoft® .NET Framework. This component is available from the Microsoft Windows® Update site. (Choose **Windows Update** from the **Start** menu.)

You can find the scripting API (application programming interface) and sample scripts in the Extras folder of the Vegas Pro application disc or on our Web site: *http://www.sonycreativesoftware.com/download/devkits*.

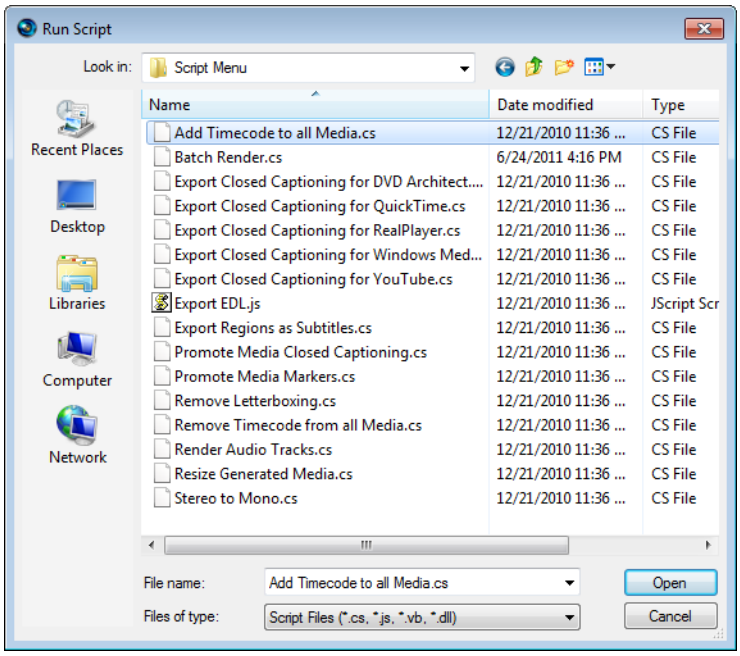
For more information about scripting, check out the Vegas Pro scripting forum: *http://www.sonycreativesoftware.com/forums/ShowTopics.asp?ForumID=21*.

**Note:** *To use scripts that were created for Vegas Pro 4.0 software, you'll need to revise the script's namespace from SonicFoundry.Vegas to Sony.Vegas. For example, the line that includes "import SonicFoundry.Vegas;" should be changed to "import Sony.Vegas;" before running the script.*

**Warning:** *Scripts can pose a security risk to your computer. A script has the power to delete files, read files, write files, execute programs, access the Internet, access files on your network, and so on. Always examine the contents of a script before running it. If you don't understand the script, do not run it unless it comes from a trusted source. In general, take the same precautions you would take for any program you download from the Internet or receive in an e-mail attachment.*

## Running a script

1. From the **Tools** menu, choose **Scripting**, and then choose **Run Script** from the submenu. The Run Script dialog appears.


Run Script
Look in:
Script Menu
Recent Places
Desktop
Libraries
Computer
Network
Name
Date modified
Type
Add Timecode to all Media.cs 12/21/2010 11:36 ... CS File
Batch Render.cs 6/24/2011 4:16 PM CS File
Export Closed Captioning for DVD Architect.... 12/21/2010 11:36 ... CS File
Export Closed Captioning for QuickTime.cs 12/21/2010 11:36 ... CS File
Export Closed Captioning for RealPlayer.cs 12/21/2010 11:36 ... CS File
Export Closed Captioning for Windows Med... 12/21/2010 11:36 ... CS File
Export Closed Captioning for YouTube.cs 12/21/2010 11:36 ... CS File
Export EDL.js 12/21/2010 11:36 ... JScript Scr
Export Regions as Subtitles.cs 12/21/2010 11:36 ... CS File
Promote Media Closed Captioning.cs 12/21/2010 11:36 ... CS File
Promote Media Markers.cs 12/21/2010 11:36 ... CS File
Remove Letterboxing.cs 12/21/2010 11:36 ... CS File
Remove Timecode from all Media.cs 12/21/2010 11:36 ... CS File
Render Audio Tracks.cs 12/21/2010 11:36 ... CS File
Resize Generated Media.cs 12/21/2010 11:36 ... CS File
Stereo to Mono.cs 12/21/2010 11:36 ... CS File
File name:
Add Timecode to all Media.cs
Open
Files of type:
Script Files (*.cs, *.js, *.vb, *.dll)
Cancel

2. Browse to the script file (.cs, .js, .vb, or .dll) you want to run.
3. Select the file and click the **Open** button. The script runs.

## Adding scripts to the Scripting menu

When you start the program, Vegas Pro software looks at the Script Menu folder in the Vegas Pro program folder to determine which scripts appear in the Scripting submenu. This folder is C:\Program Files\Sony\Vegas Pro 11.0\Script Menu by default.

1. Add or delete scripts in the Script Menu folder to change the contents of the submenu.

> **Tip:** *To prevent duplication of script files, you can use shortcuts in the Script Menu folder.*

2. From the **Tools** menu, choose **Scripting**, and then choose **Rescan Script Menu Folder** to update the menu.

## Using Vegas Pro extensions

Vegas Pro extensions are compiled scripts that are available under the **Extensions** submenu in the **View**, **Edit**, or **Tools** menus. These extensions are loaded when Vegas Pro starts and remain loaded as long as the program is running. Extensions can respond to changes in project data, control playback, and display a nonmodal interface.

You can use the Customize Toolbar dialog to add Vegas Pro extensions to the toolbar, or use the Customize Keyboard dialog to assign keyboard shortcuts to Vegas Pro extensions.

- *For more information on the Customize Toolbar dialog, see Adding buttons to the toolbar on page 409.*
- *For more information on the Customize Keyboard dialog, see Customizing keyboard shortcuts on page 412.*

Vegas Pro extensions are saved in C:\Users\<user name>\Documents\Vegas Application Extensions.

For more information about creating Vegas Pro extensions, refer to the scripting API (application programming interface) in the Extras folder of the Vegas Pro application disc or on our Web site at *http://www.sonycreativesoftware.com/download/devkits*.

## Creating a script

Vegas Pro scripting uses the Microsoft .NET framework. You can write scripts in C#, JScript, or Visual Basic .NET.

For more information on C#, see *http://msdn.microsoft.com/en-us/library/kx37x362.aspx*.

For more information on JScript, see *http://msdn.microsoft.com/en-us/library/72bd815a(vs.71).aspx*.

For more information on Visual Basic .NET, see *http://msdn.microsoft.com/en-us/library/aa903378.aspx*.

## Editing an existing script

All you need to edit a script is a simple text editor (and a working knowledge of JScript or Visual Basic .NET scripting). The scripts that are included are fully commented to help you find and edit the parameters you need.

1. Create a copy of the script (.vb or .js) file you want to edit, assigning a descriptive name to the copy.
2. Open the new copy of the script in your text editor.
3. Edit the script as needed. The comments in the script will help you find the parameters you need to edit.

   Comments are indicated with double forward slashes: //.

   For example, the AddEffectToAllMedia.js script includes the following lines:

```
// This is the full name of the effect plug-in you want to add.
var plugInName = "Sony Timecode";

// This is the name of the preset you want. Set this to null if you
// want the default preset.
var presetName = "SMPTE Drop (29.97 fps)";
```

The default script applies the Sony Timecode plug-in to all video media in your project using the SMPTE Drop (29.97 fps) preset. If you wanted to apply the Broadcast Colors plug-in's Extremely Conservative - 7.5 Setup preset to all audio media, you could edit the script as follows (changes appear in red):

```
// This is the full name of the effect plug-in you want to add.
var plugInName = "Sony Broadcast Colors";

// This is the name of the preset you want. Set this to null if you
// want the default preset.
var presetName = "Extremely Conservative - 7.5 Setup";
```

The plugInName variable should use the plug-in name that is displayed in the Plug-In Chooser. The presetName variable should use the preset name that is displayed in the Preset box in the FX window.

4. Save the script.

## Create custom button images for scripts

If you want to display custom icons for scripts in the Scripting menu and toolbars, you can add .png files to your Script Menu folder.

1. Create a 32-bit PNG file with the icon you want to use. Icons must be 16x16 pixels, and transparency is supported.
2. Save the PNG file in your Script Menu folder (typically C:\Program Files\Sony\Vegas Pro 11.0\Script Menu) using the same name as the script the icon should represent.

   For example, to assign a custom icon to the HelloWorld.js script, the icon should be saved as HelloWorld.js.png.
3. Customize the toolbar as needed, and the custom icons will be displayed in the Scripting menu (and in any toolbars that include the script) toolbar the next time you start the application.

## Vegas Pro command-line options

You can use the following commands to start Vegas Pro from the command line, open projects, start scripts, pass arguments to scripts, or start Vegas Pro extensions.

#### NOLOGO

Starts Vegas Pro without displaying the application splash screen.

**Example:** Vegas110.exe /NOLOGO

#### OPEN

Starts Vegas Pro and opens the specified media file or project.

**Examples:**

Vegas110.exe /OPEN "E:\Video\Wildflowers 001.avi"

—or—

Vegas110.exe /OPEN "E:\Vegas_Projects\24p widescreen.veg"

#### RUNSCRIPT

Starts Vegas Pro and runs the specified script.

**Examples:**

Vegas110.exe /RUNSCRIPT "C:\CustomScripts\ScriptName.cs"

—or—

Vegas110.exe /SCRIPT "C:\CustomScripts\ScriptName.cs"

#### SCRIPTARGS

Starts Vegas Pro and passes the specified arguments to a script.

**Example:** Vegas110.exe /SCRIPTARGS "<argument>" /SCRIPT "<script path>"

> **Note:** *For more information about script arguments, see the Vegas Pro Scripting API: http://www.sonycreativesoftware.com/download/devkits.*

#### CMDMODULE

Starts Vegas Pro and loads the specified Vegas Pro extension.

You can use this method to add Vegas Pro extensions that are not saved in the extensions search path.

**Example:** Vegas110.exe /CMDMODULE "E:\Extensions\MyExtension.dll"

#### OPENPRJ

Starts Vegas Pro and opens the project file referenced in the specified media file.

**Example:** Vegas110.exe /OPEN "E:\Video\Wildflowers 001.avi"

> **Note:** *This command will have no effect if the specified media file was not rendered with an embedded project path reference.*

#### COLORS

Starts Vegas Pro using the Vegas Pro color scheme or the Window color scheme. When you use the command-line option, the **Use Vegas color scheme** setting on the **Display** tab of the Preferences dialog is ignored. *For more information, see Changing the Vegas Pro color scheme on page 401.*

To run using the Vegas Pro color scheme, use Vegas110.exe /COLORS 1.

To run using the Windows color scheme, use Vegas110.exe /COLORS 2.

> **Note:** *If you're using a high-contrast color scheme in Windows, the* **Use Vegas color scheme** *preference and command-line argument are ignored.*

Chapter 23

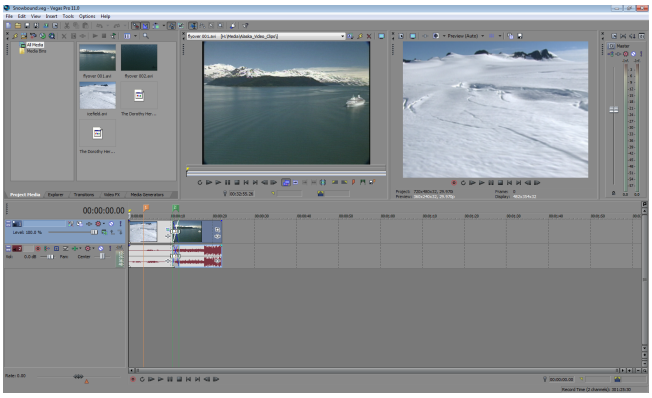
# Customizing Vegas Pro Software

You can customize Vegas® Pro software to suit your project needs and working preferences. Many of the settings depend on your equipment or studio setup. Vegas Pro software can be set to work with the components that you use in your studio.

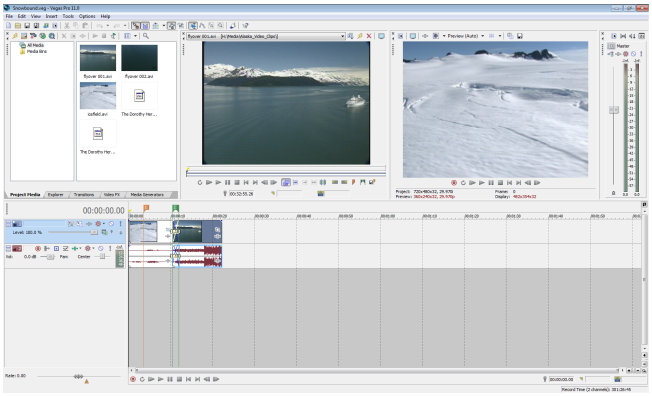
In this chapter, you will find information about functions that allow you to customize the appearance of Vegas Pro software, set a project's properties, and set the application's preferences.

## Changing the Vegas Pro color scheme

The default Vegas Pro color scheme uses shades of gray that can make using the software in a dark room easier on your eyes. You can turn off the default color scheme and use your Windows theme instead.



Default Vegas Pro color scheme



Vegas Pro with Windows 7 Basic theme

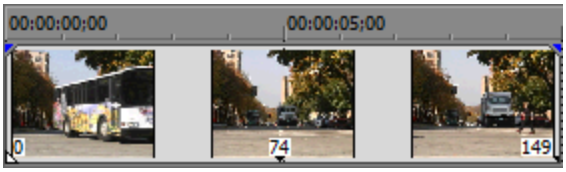
1. From the **Options** menu, choose **Preferences**.
2. Click the **Display** tab.
3. Clear the **Use Vegas color scheme** check box.
4. Click **OK**. You must restart Vegas Pro software for the change to take effect.

**Tip:** *You can also use the* **COLORS** *command line option to start Vegas Pro using the Vegas Pro color scheme or Windows color scheme. For more information, see* *COLORS on page 400*.

**Note:** *If you're using a high-contrast color scheme in Windows, the* **Use Vegas color scheme** *preference and command-line option are ignored.*

## Displaying frame numbers

You can display frame numbers on video events. Once you have enabled frame numbering, a small box appears at the bottom of the event thumbnail with the frame offset, time, or timecode. The small black arrow marks the exact position of that frame in time.




When the workspace is zoomed in far enough, each thumbnail represents a single numbered frame in the source video file. At intermediate zoom levels, marks between the frame numbers show the location of intermediate frames. These frame marks are not visible at lower magnifications.

1. From the **Options** menu, choose **Preferences**.
2. Click the **Video** tab.
3. Choose an option from the **Show source frame numbers on event thumbnails as** drop-down list.
4. Click **OK**.

## Changing the ruler format

You can customize the ruler to display a number of different standard formats. The format that you select affects how the ruler and time display window display time units.

To change the ruler's format, right-click the ruler and choose the desired time format from the shortcut menu or, from the **Options** menu, choose **Ruler Format** and choose the desired time format. You can also change ruler settings on the Project Properties dialog's **Ruler** tab. *For more information, see Ruler tab on page 407.*

**Important:** *When synchronizing audio to video, it is crucial that the SMPTE timecode format used in the sequencer or digital audio workstation is the same as the SMPTE timecode striped onto the video. This guarantees that the SMPTE times on the video screen and computer monitor synchronize during playback.*

| Format | Description |
|---|---|
| **Samples** | Displays the ruler in samples. |
| **Time** | Displays the ruler in hours:minutes:seconds.milliseconds. |
| **Seconds** | Displays the ruler in seconds. |
| **Time & Frames** | Displays the ruler in hours:minutes:seconds.frames. |
| **Absolute Frames** | Displays the ruler with all frames numbered sequentially from the beginning of your project. |
| **Measures & Beats** | Displays the ruler in measures.beats.ticks, where 64 ticks = 1 beat.<br>To set the tempo and number of beats per measure, use the Ruler tab in the Project Properties dialog. |
| **Feet & Frames 16mm (40 fpf)** | Displays the ruler in feet+frames at a rate of 40 frames per foot. |
| **Feet & Frames 35mm (16 fpf)** | Displays the ruler in feet+frames at a rate of 16 frames per foot. |
| **SMPTE Film Sync IVTC (23.976 fps, Video)** | Displays the ruler in hours:minutes:seconds:frames with a frame rate of 23.976 frames per second. This frame rate matches the frame rate used when the inverse telecine process removes pulldown from progressive-scan 24 fps (24p video).<br>This format will display running film time correctly if you will be transferring your project to film. To see running project time, use SMPTE Film Sync (24 fps) or SMPTE Drop (29.97 fps). |

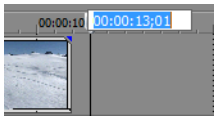
| Format | Description |
|---|---|
| **SMPTE Film Sync (24 fps)** | Displays the ruler in hours:minutes:seconds:frames with a frame rate of 24 frames per second. This frame rate matches the standard crystal-sync 16/33 mm film rate of 24 fps. |
| **SMPTE EBU (25 fps, Video)** | Displays the ruler in hours:minutes:seconds:frames with a frame rate of 25 frames per second. This is known as SMPTE EBU (European Broadcasting Union) because European television systems run at 25 fps.<br>Use SMPTE 25 EBU format for PAL DV/D1 projects. |
| **SMPTE Non-Drop (29.97 fps, Video)** | Displays the ruler in hours:minutes:seconds:frames with a frame rate of 29.97 frames per second, which leads to a discrepancy between real ("wall clock") time and the SMPTE time, because there is no compensation in the counting system as there is in Drop Frame.<br>Use SMPTE Non-Drop format for NTSC D1 projects that will be recorded on master tapes striped with Non-Drop timecode. |
| **SMPTE Drop (29.97 fps, Video)** | Displays the ruler in hours:minutes:seconds;frames with a frame rate of 29.97 fps to match the frame rate used by NTSC television systems (North America, Japan).<br>Use SMPTE Drop Frame format for NTSC DV/D1 projects.<br>Both SMPTE Drop and SMPTE Non-Drop run at 29.97 fps. In both formats, the actual frames are not discarded, but they are numbered differently. SMPTE Drop removes certain frame numbers from the counting system to keep the SMPTE clock from drifting from real ("wall clock") time. The time is adjusted forward by two frames on every minute boundary except 0, 10, 20, 30, 40, and 50. For example, when SMPTE Drop time increments from 00:00:59.29, the next value will be 00:01:00.02. |
| **SMPTE 30 (30 fps, Audio)** | Displays the ruler in hours:minutes:seconds:frames with a frame rate of 30 frames per second.<br>This rate is exactly 30 fps and is commonly used when synchronizing audio applications such as multitrack recorders or MIDI sequencers. This format should not be used when working with video. |
| **Audio CD Time** | Displays the ruler in hours:minutes:seconds:frames with a frame rate of 75 frames per second for creating Red Book CDs. |

### Creating a ruler offset

The ruler doesn't necessarily need to start with zero at the far left side. You can enter an offset to change the orientation of the ruler in a project. One use of this is to create a lead-in into a project. A five-second offset would mean that the ruler would start at -5 seconds and would be at 0 five seconds into the project.

**Note:** *You cannot create a ruler offset in an audio CD layout project.*

1. Position the cursor at the desired location along the timeline.
2. Right-click the ruler and choose **Set Time at Cursor** from the shortcut menu. The current ruler value is highlighted.



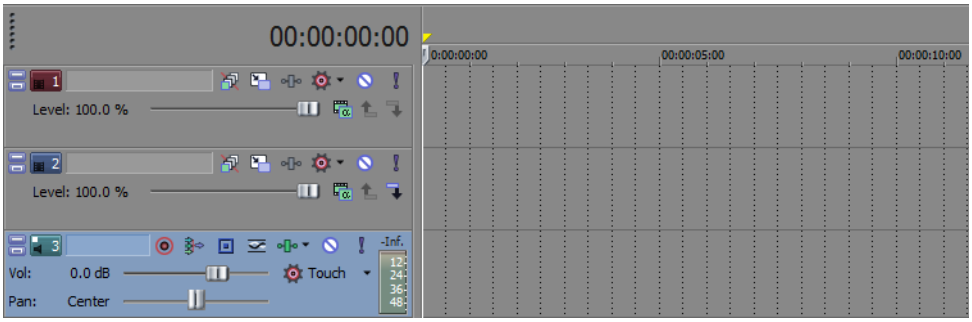

3. Type a time value.
4. Press Enter to set the ruler's time. The value that you enter at the cursor's position affects the entire ruler.

## Changing grid spacing

Grid spacing is different from the ruler and provides an alternate method of subdividing a project's time. This can be useful if you want the ruler to display SMPTE video timecode, but you need to create your music in terms of beats and measures. You can display the grid spacing in time, frame, measure, or note units. The grid can also be set to match the ruler's time format. The grid appears across all tracks in your project and the grid's lines can be used as snap points.

Ruler and grid increments can be different.

This new project is set with Ruler = SMPTE non-drop and Grid = Quarter notes.




To change grid spacing, choose **Grid Spacing** from the **Options** menu, and choose the desired time unit from the submenu. The grid spacing changes to reflect your selection.

**Note:** *In some cases, the grid lines and the ruler do not match. This is because they are two independent functions.*

## Using the Time Display window

The Time Display window reflects the cursor's position on the timeline and the end point of a time selection. You can customize the time display's settings, including what time the window displays and what colors it uses.

You can move the Time Display window from its docked position above the track list to float on the workspace. In addition, you can dock the time display in the window docking area. *For more information, see Window docking area and floating window docks on page 25.*

### Changing the time display settings

The time display always reflects the ruler settings that are selected. You can change the ruler settings via the time display or vice versa. *For more information, see Changing the ruler format on page 402.*

1. Right-click the time display. A shortcut menu appears.
2. From the shortcut menu, choose **Time Format**, and choose the desired time format from the submenu.

   Both the time display and ruler display the chosen time format.

### Changing the time display colors

You can change the background color and text color used in the time display.

1. Right-click the time display to display the shortcut menu.
2. From the shortcut menu, choose **Text Color** or **Background Color** and then choose **Custom**. The Time Display Color dialog appears.
3. Choose the color setting that you want.

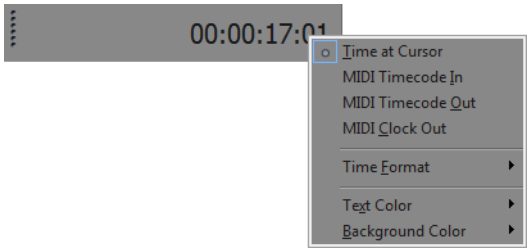
4. Click **OK** to set the text or background color or click **Cancel** to keep the existing color settings and close the dialog.

> **Tip:** *To return the time display's text or background color to its default settings, choose either* **Text Color** *or* **Background Color** *from the shortcut menu, and choose* **Default** *from the submenu.*

### Setting the time display to monitor MIDI timecode

You can use the time display to monitor the status of incoming or outgoing MIDI timecode. Vegas Pro software can monitor MIDI timecode being generated from an external device or monitor MIDI timecode and MIDI clock information generated by Vegas Pro software. From within Vegas Pro software, the time display settings work in conjunction with your project's properties and MIDI setup options. *For more information, see Sync tab on page 429.*

1. Right-click the time display.
2. From the shortcut menu, choose the type of MIDI monitoring to be displayed.



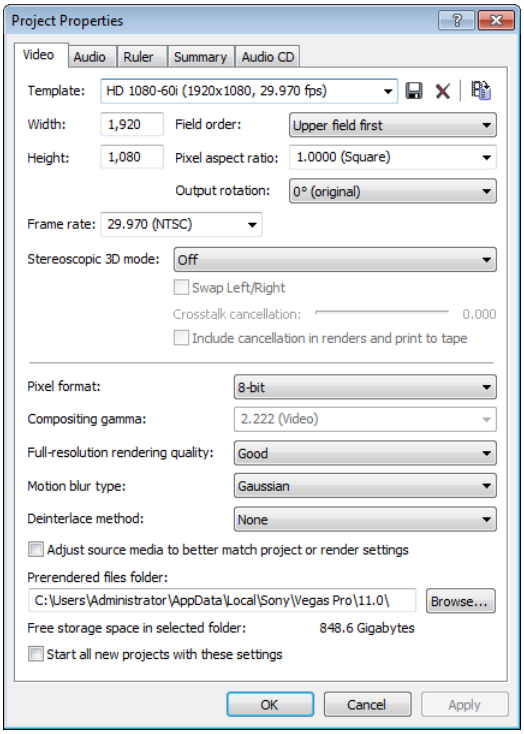

| Item | Description |
|---|---|
| **MIDI Timecode In** | Monitors incoming MIDI timecode. |
| **MIDI Timecode Out** | Monitors MIDI timecode generated by Vegas Pro software. |
| **MIDI Clock Out** | Monitors MIDI clock generated by Vegas Pro software. |

Once you have made your selection, the time display displays both the MIDI timecode being input or output and a status message.

## Working with project properties

A large range of formats and various types of media files are supported. Some settings in a project's properties are simply informational details about the project, while others control how your project is handled and its output. If you have multiple projects, the settings used for each project are stored. These settings can be saved as templates for future use.

To view and modify project properties, choose **Properties** from the **File** menu. The Project Properties dialog has five tabs: **Video**, **Audio**, **Ruler**, **Summary**, and **Audio CD**. An overview of each tab and its settings follows.



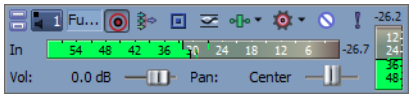

### Video tab

This tab allows you to set different characteristics the project uses to handle the video. Also, this tab displays information about the video contained in your project. *For more information, see Modifying project video properties on page 282.*

### Audio tab

Use the **Audio** tab to change the data format of the current project.

| Item | Description |
|---|---|
| **Master bus mode** | Choose **Stereo** from the drop-down list to create a two-channel stereo project.<br>Choose **5.1 Surround** if you want to perform advanced 5.1-channel mixing. *For more information about working with 5.1 surround projects, see Working with 5.1 Surround on page 247.* |
| **Number of stereo busses** | Enter the number of stereo busses for the project. *For more information about working with busses, see Using audio bus tracks on page 159.* |
| **Sample rate (Hz)** | Choose a sample rate from the drop-down list or enter your own rate. The sample rate range is 2,000 Hz to 96,000 Hz. Higher sample rates result in better quality sound, but also mean larger audio files. |
| **Bit depth** | Select a setting from the drop-down list to specify the number of bits used to store each sample. Higher values will increase the quality of playback and any recordings that you make. |
| **Resample and stretch quality** | Choose a setting from the drop-down list to determine the accuracy with which audio files will be resampled to match your project settings.<br>The **Resample and stretch quality** setting also determines the quality of processing when time-stretching audio events. |

| Item | Description |
|---|---|
| **Enable low-pass filter on LFE (surround projects only)** | Select this check box if you want to apply a low-pass filter to each track in a 5.1 surround project that is assigned to the LFE channel.<br>Applying a low-pass filter approximates the bass-management system in a 5.1 decoder and ensures that you're sending only low-frequency audio to the LFE channel.<br>**Important:** *Before rendering your surround project, check your surround authoring application's documentation to determine its required audio format. Some encoders require a specific cutoff frequency and rolloff, and your encoder may require that no filter be applied before encoding.* |
| **Cutoff frequency for low-pass filter (Hz)** | Choose a frequency from the drop-down list or type a frequency in the box to set the frequency above which audio will be ignored by the LFE channel. |
| **Low-pass filter quality** | Choose a setting from the drop-down list to determine the sharpness of filter's rolloff curve. **Best** produces the sharpest curve. |
| **Recorded files folder** | When you record audio tracks, your recorded files are saved in a single folder.<br>If you want to change the location of the folder, click the **Browse** button and choose a location. Ideally, this location should be on a different hard drive than the one where your operating system is installed.<br>**Tip:** *If you have not specified a location, you will be prompted for the location where you want to save your recorded audio when you click the* **Arm for Record** *button in the track header:*<br>  |
| **Free storage space in selected folder** | Displays the total amount of available space on the selected drive. |

## Ruler tab

Use the **Ruler** tab to change the format used to display the timeline ruler. Vegas Pro also sends tempo information to tempo-aware audio plug-ins.

| Item | Description |
|---|---|
| **Ruler time format** | Choose a setting from the drop-down list to choose how you want the Time Ruler to be displayed. You can change the format at any time after project creation. |
| **Ruler start time** | Enter the desired starting time for the project.<br>For example, the ruler can be offset to start at 1 hour for timecode synchronization purposes. |
| **Beats per minute** | Enter your project tempo in Beats Per Minute.<br>This tempo is used to determine the scale of the ruler (if you choose **Measures & Beats** from the **Ruler time format** drop-down list) and to specify the tempo used by the metronome.<br>Select the **Import at project tempo** check box on the **Audio** tab of the Preferences dialog if you want ACID loops to be stretched to match the project tempo when you add them to the timeline or preview from the Explorer or Media Manager window. Clear the **Import at project tempo** check box if you want to ignore tempo information. |
| **Beats per measure** | Specify the number of beats in each measure.<br>This tempo is used to determine the scale of the ruler (if you choose **Measures & Beats** from the **Ruler time format** drop-down list) and to specify the tempo used by the metronome. |

| Item | Description |
|---|---|
| **Note that gets one beat** | Specify the note that receives one beat. For example, if this value is four, then a quarter note gets one beat.<br>This tempo is used to determine the scale of the ruler (if you choose **Measures & Beats** from the **Ruler time format** drop-down list) and to specify the tempo used by the metronome. |

### Summary tab

| Item | Description |
|---|---|
| **Title** | Enter the a title for the project. |
| **Artist** | Enter the name of the artist. |
| **Engineer** | Enter the name of the person who mixed or edited the project. |
| **Copyright** | Enter copyright information for the project. |
| **Comments** | Enter any comments you want to associate with the project. |

### Audio CD tab

Use the **Audio CD** tab to configure options for burning disc-at-once CDs.

| Item | Description |
|---|---|
| **Universal Product Code/ Media Catalog Number** | Universal Product Codes (UPC) or Media Catalog Numbers (MCN) can be written to a CD as a means of identification. However, not all CD-R drives support this feature. Check your CD-R drive documentation to determine if your drive will write these codes.<br>Enter the code in this box, and the codes will be written to the CD along with the rest of the project.<br>Universal product codes are administered by GS1 US. For more information, see *http://www.gs1us.org*. |
| **First track number on disc** | Enter a number in the box to specify the track number of the first track.<br>**Note:** *Specifying a value other than one will produce a valid Red Book CD, but some audio CD players may be unable to play the disc.* |

## Customizing the toolbar

The main toolbar is automatically displayed below the menu bar. However, you can hide and customize the toolbar to suit your preferences. The settings that you apply to the toolbar remain set until you change them again.

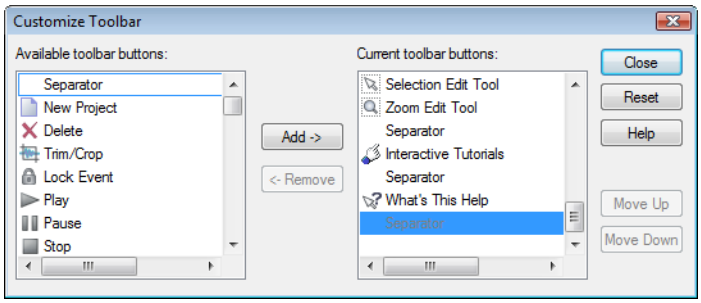
### Hiding and displaying the toolbar

If you prefer to use shortcut keys when working with your project, you can hide the toolbar to create more workspace. Choose **Toolbar** from the **View** menu to hide it. The check mark next to the command is removed and the toolbar disappears. The toolbar remains hidden until you choose **Toolbar** from the **View** menu to display it again.

### Reordering toolbar buttons

You can change the main toolbar's button order to suit your preferences. The Customize Toolbar dialog allows you to control the order and functionality available on the main toolbar. You can return the toolbar to its default settings by clicking the **Reset** button.

1. From the **Options** menu, choose **Customize Toolbar**. The Customize Toolbar dialog appears.




2. In the **Current toolbar buttons** list, select the button that you want to move and click **Move Up** or **Move Down**.
3. Click **Close** to save the toolbar changes and close the dialog.

### Adding buttons to the toolbar

A series of buttons are included that you can add to the main toolbar. These buttons are listed in the Customize Toolbar dialog. You can also add separators on the toolbar to organize the buttons to suit your preferences.

You can return the toolbar to its default settings by clicking the **Reset** button on the dialog.

1. From the **Options** menu, choose **Customize Toolbar**. The Customize Toolbar dialog appears.
2. In the **Available toolbar buttons** list, use the scroll bars to locate the button that you want to add, and then select it.
3. On the **Current toolbar buttons** pane, select the button that you want the newly added button to proceed in order.
4. Click **Add**. The new button is added above the selected button in the **Current toolbar buttons** list.

> **Note:** *You can also double-click a button to add it to the toolbar.*

5. Click **Close** to save the toolbar settings and close the dialog.

### Removing buttons from the toolbar

You can remove buttons and separators from the main toolbar. If you have added buttons to the toolbar, removing unused or unwanted buttons allows you to maximize the toolbar's space.

1. From the **Options** menu, choose **Customize Toolbar**. The Customize Toolbar dialog appears.
2. On the **Current toolbar buttons** pane, select the button that you want to remove.
3. Click **Remove**. The button is removed from the **Current toolbar buttons** pane and will not appear on the toolbar.
4. Click **Close** to save the toolbar settings and exit the dialog.

## Saving and recalling window layouts

A window layout stores the sizes and positions of all windows and floating window docks in the Vegas Pro workspace.

You can store any number of window layouts on your computer, and up to ten window layouts are available in the View menu (and via keyboard shortcuts) so you can quickly recall frequently used layouts. For example, you could have a layout dedicated to multitrack audio recording and another for ADR work.

**Notes:**

- *Window layouts are saved in the folders listed below. You can transfer layouts between computers by copying the .VegasWindowLayout files from C:\Users\<user name>\AppData\Roaming\Sony\Vegas Pro\11.0.*

  *The AppData folder is not visible unless the* **Show hidden files and folders** *radio button is selected on the* **View** *tab of the Windows Folder Options control panel.*
- *Window layouts saved in Vegas Pro 11.0 cannot be loaded in earlier versions of Vegas Pro software.*

### Loading default window layouts

Vegas Pro software comes with three built-in window layouts: a default layout, a layout optimized for audio mixing work, and a layout optimized for color correction work. To load these layouts, choose **Window Layouts** from the **View** menu, and then choose **Default**, **Audio Mixing**, or **Color Correction** from the submenu. You can also use the following keyboard shortcuts to load these layouts.

| Layout | Keyboard shortcut |
|---|---|
| Default | Ctrl+Alt+D |
| Audio Mixing | Ctrl+Alt+A |
| Color Correction | Ctrl+Alt+C |

### Saving a window layout

1. Arrange the windows and docked windows as desired.

**Tip:** *Press Ctrl+Alt+D, release the keys, and then press a number on your keyboard (not the numeric keypad) to save the layout in that space.*

2. From the **View** menu, choose **Window Layouts**, and then choose **Save Layout As** from the submenu. The Save Layout As dialog is displayed.

   Choose **Save Layout** from the submenu if you want to update the current window layout. A bullet (●) is displayed next to the current layout.
3. In the **Name** box, type the name you want to use to identify the layout. This name will be used in the Organize Layouts dialog.
4. Choose a setting from the **Shortcut** drop-down list to set the shortcut that will be used to load the layout.

   For example, if you choose 4, you could press Alt+D, release the keys, and then press 4 on your keyboard to load the layout.
5. The **Folder** box displays the path to the folder where the layout will be saved.

   Window layouts are saved in C:\Users\<user name>\AppData\Roaming\Sony\Vegas Pro\11.0 by default.

   The AppData folder is not visible unless the **Show hidden files and folders** radio button is selected on the **View** tab of the Windows Folder Options control panel.

   You can click the **Browse** button to choose a different folder.
6. Click **OK** to save the new layout.

### Loading a saved layout

From the **View** menu, choose **Window Layouts**, and then choose the window layout you want to use from the submenu.

> **Tip:** *To load a layout quickly, press Alt+D, release the keys, and then press a number on your keyboard (not the numeric keypad) to recall the layout saved in that space. If no layout is saved in that space, nothing will happen when you press the shortcut.*

If you've modified the current window layout, choose **Window Layouts**, and then choose **Reload Selected Layout** from the submenu to reset the window layout to the last-saved version.

### Adding a layout to the View > Window Layouts submenu

1. From the **View** menu, choose **Window Layouts**, and then choose **Organize Layouts** from the submenu. The Organize Layouts dialog is displayed.
2. Select a layout in the **Available layouts in current folder** box.

   This box lists the .VegasWindowLayout files in the folder displayed in the **Current layout folder** box. If the layout you want to use is saved in a different folder, you can click the **Browse** button to choose a new folder.
3. Select a layout in the **Current layouts in menu** box.
4. Click the **Assign** (or **Replace**) button to add the layout to the **View** > **Window Layouts** submenu.

   You can click the **Move Up** or **Move Down** buttons to change the order of the layouts in the menu.
5. Click the **Activate** button to apply the selected layout to the Vegas Pro workspace.
6. Click **OK** to close the Organize Layouts dialog and apply your changes.

### Removing a layout from the View > Window Layouts submenu

1. From the **View** menu, choose **Window Layouts**, and then choose **Organize Layouts** from the submenu. The Organize Layouts dialog is displayed.
2. Select a layout in the **Current layouts in menu** box.
3. Click the **Clear** button to remove the selected layout from the **View** > **Window Layouts** submenu.

   If you want to replace the selected layout, select a layout in the **Available layouts in current folder** box and click the **Replace** button.
4. Click **OK** to close the Organize Layouts dialog and apply your changes.

> **Note:** *Removing a layout from the* **View** > **Window Layouts** *submenu does not remove the .VegasWindowLayout file from your computer.*

### Deleting a layout from your computer

1. From the **View** menu, choose **Window Layouts**, and then choose **Organize Layouts** from the submenu. The Organize Layouts dialog is displayed.
2. Select a layout in the **Current layouts in menu** box.
3. Click the **Delete Layout** button to remove the selected layout from your computer.

> **Note:** *You cannot delete a layout that is included in the* **Current layouts in menu** *list. First, select the layout in the* **Current layouts in menu** *list and click the* **Clear** *button. Next, select the layout in the* **Available layouts in current folder** *list and click the* **Delete Layout** *button.*

4. Click **OK** to close the Organize Layouts dialog and apply your changes.

## Customizing keyboard shortcuts

From the **Options** menu, choose **Customize Keyboard** to customize the keyboard shortcuts available in the Vegas Pro interface.

The **Keyboard mapping** box displays the currently assigned shortcut keys. Click a tab in the middle of the dialog to choose which shortcuts you want to see.

### Editing or creating new shortcuts

1. From the **Options** menu, choose **Customize Keyboard**. The Customize Keyboard dialog is displayed.
2. Click a tab in the middle of the dialog to indicate the type of command you want to assign to a keyboard shortcut.
3. Select a command in the list.

> **Tip:** *You can type a word in the* **Show commands containing** *box to filter the list of commands to display only commands that contain the word you typed.*

4. Click the **Shortcut keys** box and press the key combination you want to assign to the selected command.
5. Click the **Add** button to assign the key combination in the **Shortcut keys** box to the selected command.

### Saving a keyboard mapping

1. From the **Options** menu, choose **Customize Keyboard**. The Customize Keyboard dialog appears.
2. Click the **Save as** button and type a name to save your current keyboard shortcuts to an .ini file in C:\Users\<user name>\AppData\Roaming\Sony\Vegas Pro\11.0.

> **Note:** *The AppData folder is not visible unless the* **Show hidden files and folders** *radio button is selected on the* **View** *tab of the Windows Folder Options control panel.*

You can use this file as a backup or to share your keyboard shortcuts with other Vegas Pro users.

### Deleting a keyboard mapping

1. From the **Options** menu, choose **Customize Keyboard**. The Customize Keyboard dialog is displayed.
2. Choose a mapping from the **Keyboard mapping** drop-down list and click the **Delete** button to remove the selected keyboard mapping.

> **Note:** *You cannot delete the default Vegas Pro keyboard mapping.*

### Importing or renaming a keyboard mapping

Copy a Vegas Pro keyboard mapping .ini file to C:\Users\<user name>\AppData\Roaming\Sony\Vegas Pro\11.0.

> **Note:** *The AppData folder is not visible unless the* **Show hidden files and folders** *radio button is selected on the* **View** *tab of the Windows Folder Options control panel.*

The next time you start Vegas Pro, the new keyboard mapping will be available from the **Keyboard mapping** drop-down list in the Customize Keyboard dialog.

> **Tip:** *If you want to edit a the name used to identify a keyboard mapping in the Customize Keyboard dialog, open the .ini file in a text editor and change the* **<Display Name>** *portion of the* **Name=<Display Name>** *entry. Save the .ini file and restart Vegas Pro to use the new name.*

### Resetting the default keyboard mapping

1. From the **Options** menu, choose **Customize Keyboard**. The Customize Keyboard dialog is displayed.
2. Choose **[Default]** from the **Keyboard mapping** drop-down list and click **OK** to restore the default configuration.

## Setting preferences

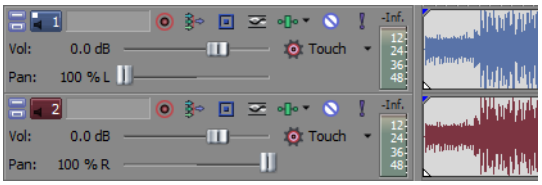
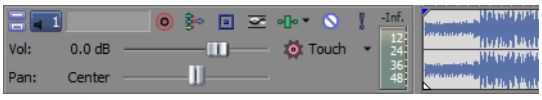
The preferences options are different from project properties. Project properties are unique to each project, while preferences affect how Vegas Pro software functions. Any changes that you make to the preferences remain set until you change them again or reset Vegas Pro software to use the default presets.

You can access the Preferences dialog by choosing **Preferences** from the **Options** menu. This dialog contains tabbed pages. The following sections explain the settings on each tab.

### General tab

The **General** tab includes a variety of settings. The following is a list of these preferences and their meaning.

| Preference | Description |
|---|---|
| **Automatically open last project on startup** | When Vegas Pro software is run, the last project saved automatically opens. |
| **Confirm media file deletion when still in use** | When deleting media in the Explorer or Project Media windows, Vegas Pro software warns you if any events in the project are using these files. |
| **Save active prerenders on project close** | Full quality preview renders are cleaned up and deleted when a project is closed, Select this if you want these prerendered files to be available later. |
| **Close media files when not the active application** | This allows media files to be edited in external editors (audio, image, etc.) while they are contained in events. |
| **Close audio and MIDI ports when not the active application** | Select this check box if you want Vegas Pro software to close audio and MIDI ports when you switch to another application. |
| **Use Net Notify to stay informed about Sony product updates** | Select this option to have Vegas Pro software periodically display information about available updates from Sony Creative Software Inc. at startup. |
| **Enable autosave** | Creates a temporary project file that can aid in crash recovery. When enabled, autosave occurs every five minutes. The autosave process does not overwrite the original project file. |
| **Save media-usage relationships in active media library** | When this check box is selected, the Media Manager™ will save information about media usage so you can perform searches for media relationships.<br>You can search for projects that use a media file, projects where a media file was previewed, media that was rendered with a media file, and so on. |
| **Enable Media Manager (requires restart)** | When this check box is selected, the Media Manager will start when you start Vegas Pro software.<br>Clear the check box to turn off the Media Manager and prevent it from starting with the application. If you're not using the Media Manager, you may want to turn it off to conserve processing power or memory. |
| **Check project file type associations at startup** | When this check box is selected, Vegas Pro will check whether Vegas Pro files are associated with Vegas Pro software and will prompt you to restore the file association if necessary. |
| **Enable joystick support** | Select this checkbox if you want to have joystick control for editing in Vegas Pro software. |
| **Render large Wave files as Wave64** | The Wave format is limited by a maximum file size of ~2GB (4GB if the **Allow Wave renders up to 4 GB** check box is selected). When this check box is selected, you can render larger files as Wave64™ files. |
| **Allow Wave renders up to 4 GB** | Select this check box to enable support for WAV files up to 4 GB before switching to WAV64. Clear the check box for compatibility with other software applications. |

| Preference | Description |
|---|---|
| **Ignore fact chunk when opening compressed WAV files** | When this check box is selected, Vegas Pro will ignore fact chunks when opening compressed WAV files.<br>A fact chunk stores information about the number of samples contained in a compressed WAV file. If you experience problems opening a compressed WAV file, select this check box and reopen the file.<br>**Note:** *If you change the setting of this check box, delete any proxy (.sfap0) files associated with compressed WAV files.* |
| **Allow pulldown removal when opening 24p DV** | Select this option to have Vegas Pro software remove pulldown on DV video files in 24 fps progressive-scan (24p) format. When this check box is cleared, Vegas Pro software will open 24p files as 29.97 fps interlaced video (60i). |
| **AAF Export - Use frame unit for audio** | Select this check box if you want to use frame units for audio tracks when you export your project as an AAF file. When the check box is cleared, audio will be exported as sample units.<br>Selecting the check box will improve compatibility with other applications for project interchange: some applications will not import your project correctly when frame units are used for video and sample units are used for audio.<br>Clear the check box only if your project contains audio only or if you know the application that will import your AAF file supports frame units for video and sample units for audio.<br>This setting has no effect when you export your project as an AAF and choose **Avid Legacy AAF File** from the **Save as Type** drop-down list. Avid legacy AAF files are always exported using frame units for audio. |
| **AAF Export - Use clip-based audio envelope** | Select this check box if you want to combine track and event gain envelopes and save them as clip-based gain envelopes when exporting AAF files. *For more information, see* *Importing and exporting AAF files on page 46*.<br>When the check box is cleared, track envelopes are saved as track envelopes, and event envelopes are saved as clip envelopes. |
| **Import MXF as multichannel** | When this check box is selected, Vegas Pro will import MXF files with all 8 channels and create tracks for each. When this check box is cleared, Vegas Pro will import MXF files as a single stereo track. |
| **Import stereo as dual mono** | When this check box is selected, two-channel audio files will be opened as separate mono audio events on separate tracks:<br>  <br>The audio events are grouped, and tracks that are created by adding media will be panned hard left and hard right. You can select an event and choose **Edit** > **Channels** to choose which channel is used for that event.<br>You can use this feature when working with two-channel source media that contains two distinct audio channels, such as an interview in which channel 1 contains the interviewer's voice and channel 2 contains the subject's voice.<br>When the check box is cleared, two-channel audio files will be opened as a stereo pair on a single track:<br>  |

| Preference | Description |
|---|---|
| **Enable no-recompress long-GOP rendering** | Select this check box if you want to pass through unedited frames without recompression (smart render) for the following formats:<br>• DV AVI<br>• DV MXF<br>• IMX MXF (IMX 24p MXF is not supported for no-recompress rendering)<br>• HD MXF<br>• HDV<br>• XDCAM EX supports smart rendering across the following formats:<br>  • SP 18.3 Mbps CBR 1280x720p to/from XDCAM EX and HDV HD-1<br>  • SP 25 Mbps CBR 1440x1080i to/from XDCAM EX, XDCAM HD, and HDV HD-2<br>  • HQ 35 Mbps VBR 1440x1080 to/from XDCAM EX and XDCAM HD<br>  • HQ 35 Mbps VBR 1280x720p to/from XDCAM EX<br>  • HQ 35 Mbps VBR 1920x1080 to/from XDCAM EX<br>In order to perform rendering without recompression, the width, height, frame rate, field order, profile, level, and bit rate of the source media, project settings, and rendering template must match. Frames that have effects, compositing, or transitions applied will be rendered. |
| **Prompt to keep files after recording** | Opens a dialog where you can enter a name and select a location where audio will be saved after recording into a track. |
| **Create undos for FX parameter changes** | Allows you to undo changes made in the FX, Transition, Pan/Crop plug-in, and Track Motion windows. |
| **Keep bypassed FX running (to avoid pause on bypass/enable)** | Select this check box if you want effects to remain open so you can bypass/enable effects with no pause for A/B testing. When the check box is cleared, effects are fully bypassed, conserving processing power. |
| **Automatically name regions and markers if not playing** | When regions and markers are added, this option automatically prompts you for a name. This does not happen when adding markers on-the-fly during playback. |
| **Use linear scrub range** | When this check box is selected, the scrub control uses a linear range. When this check box is cleared, the scrub control uses a logarithmic range. |
| **Allow Ctrl+drag cursor style scrub over events** | Vegas Pro software allows scrubbing on empty sections of the timeline using Ctrl+drag on the cursor. Select this option to enable timeline scrubbing over events as well. |
| **Make spacebar and F12 Play/Pause instead of Play/Stop** | Changes the spacebar and F12 keys to start and pause playback rather than start and stop. |
| **Always draw marker lines** | Select this check box if you want Vegas Pro software to extend marker and region lines across tracks in the timeline. When the check box is cleared, marker lines are drawn only when Enable Snapping is turned on. |
| **Allow edit cursor to be dragged** | Select this check box if you want to be able to drag the cursor to change its position on the timeline and in the Trimmer window. When this check box is selected, you can position the cursor without losing your loop region.<br>To create a time selection without moving the cursor, hold the Shift key. |
| **Double-click on media file loads into Trimmer instead of tracks** | The default Explorer double-click behavior is to insert an event at the cursor position on the timeline. Select this option to open the media file in the Trimmer instead. *For more information, see Opening files in the Trimmer by default on page 114.* |
| **Show Trimmer history with file name first, then folder** | The Trimmer history drop-down list displays the media file's name first, followed by the folder it is in. Select this check box to reverse the names. *For more information, see Using the Trimmer History list on page 111.* |
| **Automatically save Trimmer markers and regions with media file** | Markers and regions created at the media file level in the Trimmer can be saved to the file. *For more information, see Automatically saving Trimmer markers and regions with media files on page 112.* |
| **Recently used project list** | Select the number of files to be listed at the bottom of the **File** menu. |
| **Temporary files folder** | Select a location for all temporary files. |
| **Free storage space in selected folder** | Displays the available disk space in the folder specified in the **Temporary files folder** box. |
| **Default All** | Restores all general preferences to the default settings. |

## Video tab

The **Video** tab in the Preferences dialog controls the display of video media, video events and video tracks.

| Preference | Description |
|---|---|
| **Dynamic RAM Preview max (MB)** | Determines the size of the RAM cache for building dynamic RAM previews in the Video Preview window. *For more information, see Building dynamic RAM previews on page 348.* |
| **Maximum number of rendering threads** | This setting specifies the maximum number of threads that will be used for rendering files.<br>Increasing the setting will not increase performance beyond the number of available processors; for example, if you have a single-processor computer, choosing **2** will not improve rendering performance.<br>Decrease the setting if you have a multiprocessor (or multicore) computer and want to limit processor use or turn off multithreaded rendering. For example, if you had a dual-processor hyperthreaded computer, choosing **3** would allow you to keep one thread available for other tasks while rendering. |
| **GPU acceleration of video processing** | Many built-in video processing functions and video plug-ins in Vegas Pro support GPU acceleration. To enable GPU-accelerated video processing, choose a device from the **GPU acceleration of video processing** drop-down list.<br>Choose **Off** to turn off this feature.<br>**Notes:**<br>• *Only compatible devices are displayed in this list.*<br>• *The GPU Accelerated folder in the Transitions, Video FX, Media Generators, and Compositors windows allow you to easily identify GPU-accelerated plug-ins.* |
| **Show source frame numbers on event thumbnails as** | Display frame, time, or timecode numbering on video event thumbnails. |
| **Thumbnails to show in video events** | Choose a setting from the drop-down list to choose which thumbnails you want to draw in video events.<br>• **None**: No video frames are displayed.<br>• **Head**: Only the first frame is displayed.<br>• **Head, Tail**: The first and last frame are displayed.<br>• **Head, Center, Tail**: The first, middle, and last frames are displayed.<br>• **All**: All frames are displayed.<br>**Tip:** *If you want to toggle audio waveforms in events, choose* **Audio Event Waveforms** *from the* **View** *menu.* |
| **Use external video capture application** | Select the check box and browse for the application to be launched when you click the **Open Video Capture** button ( ). |
| **Action safe area**<br>**Title safe area** | Sets the reference overlay safe areas in the Video Preview window. *For more information, see Identifying safe areas on page 350.* |
| **Horizontal grid divisions and Vertical grid divisions** | Sets the spacing of the grid overlay in the Video Preview window used in aligning visual elements in a project. *For more information, see Changing grid spacing on page 404.* |
| **Display at project size** | Sets the Video Preview window to always display the video at full project size. |
| **Simulate device aspect ratio** | Determines how the video is displayed in the Video Preview window. In short, televisions display rectangular pixels and computer monitors display square pixels. This can result in a distorted preview, although the source media and rendered video is unaffected. |
| **Background color** | Sets the background color of the Video Preview window (black by default) that shows either when there is no visual content or when using a transparent overlay with no background visual content. |
| **Stereoscopic 3D mode** | If you're working with a stereoscopic 3D project and want to override the project settings for previewing your stereoscopic 3D project in the Video Preview window, choose a setting from the **Stereoscopic 3D mode** drop-down list.<br>*For more information about previewing stereoscopic 3D projects, see Setting up stereoscopic 3D previews on page 126.* |

| Preference | Description |
|---|---|
| **Display take names** | Select this check box if you want to display take names in the Video Preview window when editing multicamera video. |
| **Display take numbers** | Select this check box if you want to display take numbers in the Video Preview window when editing multicamera video. |
| **Active take indicator** | Click to display a color picker you can use to choose the color that will be used to indicate the current take when editing multicamera video.<br>Click the color swatch to display a color picker, where you can choose any color using the RGBA or HSLA controls. Click the **Change Color Space** button ( ) to switch between RGB and HSL color modes, or click the **Pick Color from Screen** button ( ) to sample a color from your screen. Click **OK** to return to the **Video** tab, and then click **OK** to save your preference changes. |
| **Track fade top** | Determines the color of the fade-to-color envelope when the envelope is dragged toward the top of the track. *For more information, see Fade-to-color automation (video only) on page 169.*<br>Click the color swatch to display a color picker, where you can choose any color using the RGBA or HSLA controls. Click the **Change Color Space** button ( ) to switch between RGB and HSL color modes, or click the **Pick Color from Screen** button ( ) to sample a color from your screen. Click **OK** to return to the **Video** tab, and then click **OK** to save your preference changes.<br>**Tip:** *You can set the track fade colors for each video track independently by right-clicking the track header, choosing* **Fade Colors***, and then choosing* **Top** *or* **Bottom** *from the submenu.* |
| **Track fade bottom** | Determines the color of the fade-to-color envelope when the envelope is dragged toward the bottom of the track. *For more information, see Fade-to-color automation (video only) on page 169.*<br>Click the color swatch to display a color picker, where you can choose any color using the RGBA or HSLA controls. Click the **Change Color Space** button ( ) to switch between RGB and HSL color modes, or click the **Pick Color from Screen** button ( ) to sample a color from your screen. Click **OK** to return to the **Video** tab, and then click **OK** to save your preference changes. |
| **Default All** | Restores all video preferences to the default settings. |

### Preview Device tab

From the **Options** menu, choose **Preferences** and then click the **Preview Device** tab to configure an external monitor. Your video will be sent to this device when you click the **Preview on External Monitor** button ( ) in the Video Preview window.

**Tips:**

- *If your project contains complex effects or compositing and you cannot attain full-frame-rate playback, use selective prerendering to prerender the sections of your project that cannot be rendered in real time.*
- *If your video preview device supports audio playback (please see the* **Details** *box on the* **Preview Device** *tab for device status), you can play your project audio through your video preview device.*

  *First, configure your video preview device, and then click the* **Audio Device** *tab and choose* **Preview Device** *from the* **Audio device type** *drop-down list.*

### Configuring an AJA Io Express, KONA 2K, LH, LHe, LHi, LS, or LSe SDI card

If you have a supported AJA SDI card, you can configure Vegas Pro software to work with it.

1. From the **Options** menu, choose **Preferences** and then click the **Preview Device** tab.
2. From the **Device** drop-down list, choose **AJA Video Device**. The Details box displays information about the device.
3. Use the **Conform output to the following format** controls to adjust the video to display properly on your external monitor.
   a. Choose the desired format from the **Conform output to the following format** drop-down list.
   b. Select a radio button to indicate when you want to adjust the output to the selected format.

| Setting | Description |
|---|---|
| **Only when the project does not match any available format** | Select this radio button if you want to adjust the video only if the project settings do not conform to a standard format. *For more information, see Working with project properties on page 406.* |
| **Always** | Select this radio button if you want to adjust the video output to the selected format whenever you preview on the external monitor.<br>Use this setting when you do not have a preview device that supports your required project format.<br>For example, if you're creating a PAL project, but you don't have a PAL monitor, you could use this setting to preview on an NTSC monitor. |

4. Select the **Use progressive segmented frame (psf) video formats** check box if your project properties are set to a progressive-scan format and you want to preview on a device that stores and transfers progressive scan frames by dividing fields.
5. Select the **Use 10-bit encoding** check box if you're using 10-bit source material and the **Pixel format** setting on the **Video** tab of the Project Properties tab is set to **32-bit floating point (video levels)**. *For more information, see Modifying project video properties on page 282.*

   Enabling 10-bit encoding allows your preview to maintain higher color resolution when previewing video.

   When the check box is not selected, the video preview output will use 8-bit encoding.
6. If audio and video do not play back in synchronization, drag the **Sync offset** slider to specify a frame offset to restore synchronization.

**Note:** *This setting affects preview synchronization only. Audio and video synchronization in your project is unaffected. Depending on your hardware setup, you may need to adjust your settings. For example, you might need one setting when previewing directly to a monitor and a slightly higher setting when previewing through a monitor that is connected to a deck.*

7. Choose a setting from the **Genlock** drop-down list if you want to synchronize your video output with a reference signal.

| Setting | Description |
|---|---|
| **Video In** | Synchronizes to the SDI input. |
| **Ref In** | Synchronizes to an external reference input signal. |
| **Free Run** | Ignores all input signals and uses internal timing. |

8. Select the **Recompress edited frames** check box to recompress any edited frames in your project before previewing. When the check box is cleared, edited frames will not be passed to the device.
9. Select the **Display frames in Video Preview window during playback** check box if you want to preview on the external monitor and in the Vegas Pro Video Preview window simultaneously.

   When the check box is cleared, video is sent only to the external monitor.
10. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for previewing your project. *For more information, see Working with rotated projects on page 39.*

    When the check box is cleared, the media is rotated according to its Media Properties setting, but the Video Preview output is unrotated. You can use this setting to proof your project on an unrotated display.
11. Choose a setting from the **Stereoscopic 3D mode** drop-down list if you're working with a stereoscopic 3D project and want to override the project settings for previewing your stereoscopic 3D project on an external monitor.

    *For more information about previewing stereoscopic 3D projects, see Setting up stereoscopic 3D previews on page 126.*

### Configuring a Blackmagic Design DeckLink HD Extreme, Intensity Pro, or HD Extreme 3D SDI card

If you have a Blackmagic Design DeckLink HD Extreme, Intensity Pro, or HD Extreme 3D SDI card, you can configure it to work with Vegas Pro software.

1. From the **Options** menu, choose **Preferences** and then click the **Preview Device** tab.
2. From the **Device** drop-down list, choose **Blackmagic Design DeckLink Video Device**. The Details box displays information about the device.
3. Use the **Conform output to the following format** controls to adjust the video to display properly on your external monitor.
   a. Choose the desired format from the **Conform output to the following format** drop-down list.
   b. Select a radio button to indicate when you want to adjust the output to the selected format.

| Setting | Description |
|---|---|
| **Only when the project does not match any available format** | Select this radio button if you want to adjust the video only if the project settings do not match a standard format. |
| **Always** | Select this radio button if you want to adjust the video output to the selected format whenever you preview on the external monitor.<br>Use this setting when you do not have a preview device that supports your required project format.<br>For example, if you're creating a PAL project, but you don't have a PAL monitor, you could use this setting to preview on an NTSC monitor. |

4. Select the **Use 10-bit encoding** check box if you're using 10-bit source material and the **Pixel format** setting on the **Video** tab of the Project Properties window is set to **32-bit floating point**.

   Enabling 10-bit encoding allows your preview to maintain higher color resolution when previewing video.

   When the check box is not selected, the video preview output will use 8-bit encoding.
5. If audio and video do not play back in synchronization, drag the **Sync Offset** slider to specify a frame offset to restore synchronization.

> **Note:** *This setting affects preview synchronization only. Audio and video synchronization in your project is unaffected. Depending on your hardware setup, you may need to adjust your settings. For example, you might need one setting when previewing directly to a monitor and a slightly higher setting when previewing through a monitor that is connected to a deck.*

6. Select the **Recompress edited frames** check box if you want to recompress edited frames in your project before previewing. When the check box is cleared, edited frames will not be passed to your preview device.
7. Select the **Display frames in Video Preview window during playback** check box if you want to preview on the external monitor and in the Vegas Pro Video Preview window simultaneously.

   When the check box is cleared, video is sent only to the external monitor.
8. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties window for previewing your project.

   When the check box is cleared, the media is rotated according to its Media Properties setting, but the Video Preview output is unrotated. You can use this setting to proof your project on an unrotated display.
9. Choose a setting from the **Stereoscopic 3D mode** drop-down list if you're working with a stereoscopic 3D project and want to override the project settings for previewing your stereoscopic 3D project on an external monitor.

   *For more information about previewing stereoscopic 3D projects, see* *Setting up stereoscopic 3D previews on page 126*.

### Configuring an OHCI-compliant IEEE 1394/DV device

If you have an OHCI-compliant IEEE 1394/DV device, you can configure it to work with Vegas Pro software.

1. From the **Options** menu, choose **Preferences** and then click the **Preview Device** tab.
2. In the **Device** drop-down list, select **OHCI-compliant IEEE 1394/DV**. Information about the device displays in the **Details** area.
3. Use the **Conform output to the following format** controls to adjust the video to display properly on your external monitor.
   a. Choose the desired format from the **Conform output to the following format** drop-down list.
   b. Select a radio button to indicate when you want to adjust the output to the selected format.

| Setting | Description |
|---|---|
| **Only when the project does not match any DV format** | Select this radio button if you want to adjust the video only if the project settings do not conform to a standard DV format. *For more information, see Working with project properties on page 406.* |
| **Always** | Select this radio button if you want to adjust the video output to the selected format whenever you preview on the external monitor.<br>Use this setting when you do not have a preview device that supports your required project format.<br>For example, if you're creating a PAL project, but you don't have a PAL monitor, you could use this setting to preview on an NTSC monitor. |

4. If audio and video do not play back in synchronization, drag the **Sync offset** slider to specify a frame offset to restore synchronization.

> **Note:** *This setting affects preview synchronization only. Audio and video synchronization in your project is unaffected. Depending on your hardware setup, you may need to adjust your settings. For example, you might need one setting when previewing directly to a monitor and a slightly higher setting when previewing through a monitor that is connected to a deck.*

5. Select the **Recompress edited frames** check box to recompress any edited frames in your project before previewing. When the check box is cleared, edited frames will not be passed to the device.

   If you're previewing a project that consists of DV media with no compositing or transitions, the DV will be passed directly to your preview device. If, however, you added a 6-frame crossfade, the crossfade would be passed to the preview device only if the check box is selected.
6. Select the **Display frames in Video Preview window during playback** check box if you want to preview on the external monitor and in the Vegas Pro Video Preview window simultaneously.

   When the check box is cleared, video is sent only to the external monitor.
7. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for previewing your project. *For more information, see Working with rotated projects on page 39.*

   When the check box is cleared, the media is rotated according to its Media Properties setting, but the Video Preview output is unrotated. You can use this setting to proof your project on an unrotated display.
8. Choose a setting from the **Stereoscopic 3D mode** drop-down list if you're working with a stereoscopic 3D project and want to override the project settings for previewing your stereoscopic 3D project on an external monitor.

   *For more information about previewing stereoscopic 3D projects, see Setting up stereoscopic 3D previews on page 126.*

**Tip:** *You can also use the Windows Graphics Card device on a computer with a single monitor. When you enable the external monitor, the preview window will fill your screen.*

1. From the **Options** menu, choose **Preferences** and then click the **Preview Device** tab.
2. In the **Device** drop-down list, choose **Windows Graphics Card**. The **Details** box displays information about the device.
3. From the **Display Adapter** drop-down list, choose the device where your preview monitor is connected.

   You can click the **Identify Displays** button to determine which display corresponds to each setting in the drop-down list. A number will be displayed on each monitor.

**Note:** *If the monitor number is displayed in red, the graphics card does not support 3D acceleration or acceleration has been turned off. In Windows, you can go to Start > Settings > Control Panel > Display > Settings > Advanced > Troubleshoot to turn on acceleration if your adapter supports it.*

4. Select the **Scale output to fit display** check box if you want the video preview to fill the display.
5. Select the **Apply deinterlace filter** check box if you're previewing interlaced video on a noninterlaced display. This filter can reduce the artifacts you often see on the edges of moving areas.

**Important:** *The* **Apply deinterlace filter** *check box will be unavailable if your video adapter does not support pixel shading.*

6. If you want to adjust color reproduction for video previews, select the **Adjust levels from studio RGB to computer RGB** check box.

   If your source media conforms to studio RGB color (black=16 and white=235) and you will be previewing on your computer's CRT or LCD monitor, this setting expands the studio RGB range to 0 to 255 to conform to a computer display.
7. Select the **Recompress edited frames** check box if you want to recompress edited frames in your project before previewing. When the check box is cleared, edited frames will not be passed to your preview device.
8. Select the **Display frames in Video Preview window during playback** check box if you want to preview on the secondary monitor and in the Vegas Pro Video Preview window simultaneously.

   When the check box is cleared, video is sent only to the secondary monitor.
9. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for previewing your project. *For more information, see* *Working with rotated projects on page 39*.

   When the check box is cleared, the media is rotated according to its Media Properties setting, but the Video Preview output is unrotated. You can use this setting to proof your project on an unrotated display.
10. Choose a setting from the **Stereoscopic 3D mode** drop-down list if you're working with a stereoscopic 3D project and want to override the project settings for previewing your stereoscopic 3D project on an external monitor.

    *For more information about previewing stereoscopic 3D projects, see* *Setting up stereoscopic 3D previews on page 126*.

### Stereoscopic 3D Windows Graphics Card

The **Windows Graphics Card** setting will work with any graphics card that supports OpenGL. In particular, if you are using **Line alternate** or **Checkerboard** mode, this driver will provide correct output regardless of project resolution.

To support 120 Hz displays with active shutter glasses, use the **Left and Right** mode with most graphics cards that support NVIDIA 3D Vision for Quadro.

When setting up a Quadro video card, please refer to the GeForce 3D Vision Quick Start Guide that was included with your hardware for installation and setup information. For additional information, graphics card and emitter drivers, and for hardware requirements, please see *http://www.nvidia.com/object/quadro_pro_graphics_boards.html*.

1. From the **Options** menu, choose **Preferences** and then click the **Preview Device** tab.
2. From the **Device** drop-down list, choose **Windows Graphics Card**. The Details box displays information about the device.

3. From the **Display** drop-down list, choose your 3D display.

   You can click the **Identify Displays** button to determine which display corresponds to each setting in the drop-down list. A number will be displayed on each monitor.

**Note:** *If the monitor number is displayed in red, the graphics card does not support 3D acceleration or acceleration has been turned off. You can go to Start > Settings > Control Panel > Display > Settings > Advanced > Troubleshoot to turn on acceleration if your adapter supports it.*

4. Select the **Scale output to fit display** check box if you want the video preview to fill the display.
5. Select the **Apply deinterlace filter** check box if you're previewing interlaced video on a noninterlaced display. This filter can reduce the artifacts you often see on the edges of moving areas.

**Important:** *The* **Apply deinterlace filter** *check box will be unavailable if your video adapter does not support pixel shading.*

6. If you want to adjust color reproduction for video previews, select the **Adjust levels from studio RGB to computer RGB** check box.

   If your source media conforms to studio RGB color (black=16 and white=235) and you will be previewing on your computer's CRT or LCD monitor, this setting expands the studio RGB range to 0 to 255 to conform to a computer display.
7. Select the **Wait for vertical sync** check box if you want to wait for the monitor's vertical refresh timing before displaying frames.

   This setting can be used to correct image tearing.
8. Select the **Recompress edited frames** check box.
9. Select the **Display frames in Video Preview window during playback** check box if you want to preview on the secondary monitor and in the Vegas Pro Video Preview window simultaneously.

   When the check box is cleared, video is sent only to the secondary monitor.
10. Select the **Use project output rotation setting** check box if you're rendering a rotated project and want to use the **Output rotation** setting from the Project Properties dialog for previewing your project.

    When the check box is cleared, the media is rotated according to its Media Properties setting, but the Video Preview output is unrotated. You can use this setting to proof your project on an unrotated display.
11. From the **Stereoscopic 3D mode** drop-down list, choose the setting that you want to use for previewing your project on a 3D monitor.

    Choose **Use project settings** if you want to use the setting from the **Video** tab in the Project Properties dialog, or choose another mode if you want to override the project setting when previewing on an external monitor.

| Setting | Description |
|---|---|
| **Use project settings** | Uses the setting from the **Video** tab in the Project Properties dialog. |
| **Side by side (half)** | Choose this setting when your graphics card is connected to a 3D-capable HDTV that displays left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed as half of the available horizontal resolution. |
| **Side by side (full)** | Choose this setting when your graphics card is connected to a 3D-capable HDTV that displays left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed using the full horizontal resolution. |
| **Top/bottom (half)** | Choose this setting when your graphics card is connected to a 3D-capable HDTV that displays left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed as half of the available vertical resolution. |
| **Top/bottom (full)** | Choose this setting when your graphics card is connected to a 3D-capable HDTV that displays left- and right-eye views in a single frame.<br>Left- and right-eye views are displayed using the full vertical resolution. |
| **Anaglyphic (red/cyan)**<br>**Anaglyphic (amber/blue)**<br>**Anaglyphic (green/magenta)** | Left- and right-eye views use color filters to allow anaglyphic glasses to separate the left- and right-eye views. |

| Setting | Description |
|---|---|
| **Line alternate** | Choose this setting when your graphics card is connected to a 3D-capable HDTV that displays left- and right-eye views in line-alternate format.<br>Left- and right-eye views are interlaced using half of the available vertical resolution. |
| **Checkerboard** | Choose this setting to preview on a DLP-based 3D monitor.<br>Left- and right-eye views are tiled using half of the available horizontal and vertical resolution. |
| **Left only**<br>**Right only** | Choose the **Left only** or **Right only** setting for editing on a 2D monitor or to adjust one eye's output independently. |
| **Blend** | Choose this setting to blend the left- and right-eye images. This setting is useful when adjusting events. |
| **Difference** | Choose this setting when performing vertical adjustments to minimize vertical disparity. |
| **Left and Right** | Choose this setting when you're using a graphics card and monitor that support NVIDIA 3D Vision for GeForce or Quadro with active shutter glasses or a 3D-capable HDTV that is connected to your computer via HDMI 1.4. |

12. Select the **Swap Left/Right** check box if you need to swap the left- and right-eye pictures. This setting is useful if you're using a line-alternate display that displays the right eye on top, if you're using magenta/green anaglyphic glasses, or to create cross-eye free-view 3D.
13. Drag the **Crosstalk cancellation** slider if you experience image bleed-through. For example, if you see right-eye images in your left eye, you can adjust the **Crosstalk cancellation** slider to compensate.

    When your project's **Stereoscopic 3D mode** is set to **Side by side**, **Top/bottom**, **Line alternate**, or **Checkerboard** mode, crosstalk cancellation is active only when the **Full-resolution rendering quality** drop-down list is set to **Good** or **Best**. When using anaglyphic modes, crosstalk cancellation is active for any quality level.
14. Click **OK** to close the Preferences dialog.

### Audio tab

The **Audio** tab allows you to set preferences to optimize how your computer's components are used to handle resource-intensive audio. This tab also allows you to configure Vegas Pro software to the equipment that is connected to your computer.

| Preference | Description |
|---|---|
| **Waveform display while recording** | Choose a setting from the drop-down list to specify how to display audio waveforms while recording:<br>• **Don't show waveforms** No waveforms will be displayed on any tracks until the recording process has been completed.<br>• **Show waveforms for a single track** Selecting this option will display waveforms only when a single track is armed. If you arm multiple tracks, waveforms will not show.<br>• **Show all waveforms** If you are arming multiple tracks for record, all tracks will display the waveform during recording. |
| **Normalize peak level (dB)** | Use the slider to change the default Peak Level settings. This value will be used when you use the **Normalize** event switch. |
| **Import audio at project tempo** | When this check box is selected, ACID loops are automatically stretched to match the project tempo (specified on the **Ruler** tab of the Project Properties dialog) when you add them to the timeline or preview from the Explorer window.<br>When the check box is cleared, tempo information is ignored. |
| **Record to Broadcast Wave Format** | When this check box is selected, Vegas Pro software records Broadcast Wave Format (.bwf) metadata when recording .wav files. You can view this information on the **General** tab of the Properties dialog for an event. *For more information, see Modifying media file properties on page 284.*<br>Included in the .bwf metadata is a **Time reference** value. This item tracks where on the timeline the file was recorded. When you import a recorded .bwf file, it is added to the timeline at the same location it was originally recorded.<br>The originator (Vegas) and originator reference (a unique ID number) are also recorded. |

| Preference | Description |
|---|---|
| **Track prefader sends listen to mute** | Select this check box if you want pre-volume sends from tracks to busses and assignable effects to respond to the track mute state.<br>When the check box is cleared, the pre-volume sends are not affected by the mute state (in order to facilitate cue mixes). |
| **Use legacy track send gain** | Select this check box if you want to configure audio track sends to behave as they did in Vegas Pro 7.0 and earlier. When the check box is selected, you can open projects created with earlier versions of Vegas Pro and be assured they will sound the same as they did in earlier versions of Vegas Pro. |
| **Preferred audio editor** | Use this option to specify the location of the audio-editing application you want to use with your Vegas Pro projects.<br>This editor will be displayed in the **Tools** menu when you want to open an event in a sound editor. If Sound Forge software is detected on your system, it automatically becomes the default editor. To specify an audio editor, click the **Browse** button and browse for the editor's .exe file. |
| **Metronome** | Select the **Use default metronome sounds** radio button to use the default normal and accent sounds when using the metronome, or click **Use custom metronome sounds** and specify the files you want to use in the **Normal** and **Accent** boxes.<br>• **Normal** Specifies the sound file for the metronome when the **Use custom metronome sounds** radio button is selected.<br>• **Accent** Specifies the accent sound file for the metronome when the **Use custom metronome sounds** radio button is selected. |
| **Default All** | Restores all audio preferences to the default settings. |

## Audio Device tab

Use the **Audio Device** tab to specify playback and recording options. To display this tab, choose **Preferences** from the **Options** menu, then click the **Audio Device** tab. Click the **Advanced** button to access the advanced audio preferences.

| Preference | Description | |
|---|---|---|
| **Audio device type** | Choose a driver type from the drop-down list. | |
| | **ASIO** | Allows you to choose a specific low-latency ASIO device from the **Default stereo and front playback device** drop-down list. |
| | **Direct Sound Surround Mapper** | When you're working with a 5.1 surround project and a surround-capable sound card, this setting uses the default Windows audio device to send 5.1-surround audio to your sound card. |
| | **Microsoft Sound Mapper** | Uses the default Windows audio device for playback and recording. |
| | **Windows Classic Wave Driver** | Allows you to choose a specific audio device from the **Default stereo and front playback device** drop-down list. |
| | Click the **Advanced** button to change settings for the selected device. | |
| **Default stereo and front playback device** | Choose the device that you want to use for playing stereo sound data and the front-left and -right channels of a 5.1 surround project.<br>Selecting the Microsoft Sound Mapper allows Windows to select an appropriate device to use for the current sound data.<br>**Note:** *If you have selected Microsoft Sound Mapper, you will not be able to assign busses to different devices.* | |
| **Default rear playback device** | Choose the device that you want to use for playing the rear channels of a 5.1 surround project. | |
| **Default center and LFE playback device** | Choose the device that you want to use for playing the center and low-frequency effect channels of a 5.1 surround project. | |
| **Playback buffering (seconds)** | Sets the amount of memory used during project playback. *For more information, see Adjusting the playback buffering slider on page 425.* | |

| Preference | Description |
|---|---|
| **Enable track buffering** | Select this check box and drag the **Track buffering** slider if you want to adjust the amount of audio that is prerendered ahead of the cursor position.<br>When the check box is selected, a separate processing thread is used to render audio from tracks. On multiprocessor or multicore computers, a thread will be created for each logical processor.<br>When the check box is cleared, a single processing thread is used to render audio from tracks and busses. |
| **Default audio recording device** | Sets the default device for recording into a track. |
| **Automatically detect and offset for hardware recording latency** | Select the check box to automatically compensate for offset between the time you initiate recording and when your sound card starts recording.<br>Clear the check box and drag the **User offset (samples) (ms)** slider to specify an offset value. |
| **Advanced** | Clicking this button opens the Advanced Audio Preferences dialog. *For more information, see Advanced audio preferences on page 425.* |
| **Default All** | Restores all audio device preferences to the default settings. |

### Advanced audio preferences

You can access advanced settings by clicking the **Advanced** button on the **Audio Device** tab. The Advanced Audio Configuration dialog displays all of the audio devices that are installed on your computer and allows you to set the controls for each device.

| Preference | Description |
|---|---|
| **Audio devices** | This list contains all of the audio devices that are installed in your computer. Selecting one from the list allows you to set the options below for that device. |
| **Interpolate position** | During project playback, you may notice that the cursor position is different than what you are hearing. This problem stems from inaccuracies in some audio devices. Select this control's check box to have Vegas Pro software attempt to compensate for the inaccuracies by interpolating the cursor's correct position during playback or recording. |
| **Position bias** | The position bias control gives you additional cursor control when it is inaccurately displayed during project playback and recording. If you have enabled the **Interpolate position** control and are still experiencing cursor position inaccuracies, move the **Position bias** control forward or backward to compensate for the inaccuracies of the audio device. |
| **Do not pre-roll buffers before starting playback** | When this option is not selected, Vegas Pro software begins storing (buffering) project audio information prior to playback. This storing is very fast and unnoticeable in most cases. However, some audio devices stutter when you begin playback as a result of the buffering process. If your audio stutters when you start playback, select this check box to prevent buffering audio information prior to playback. |
| **Audio buffers** | Drag the slider to set the number of audio buffers that will be used. Adjusting this setting can help you synchronize the input and output for record input monitoring. |
| **Buffer size (samples)** | Choose a setting from the drop-down list to indicate the buffer size you want to use. Choose **MME** to use the **Playback buffering** setting on the Audio Device tab in the Preferences window. |
| **Priority** | Choose a setting from the drop-down list to set the priority that is assigned to your audio buffers. Increasing the buffers' priority can help you attain smoother playback, but it can also adversely affect other processes. |
| **Enable input monitoring** | Select this check box to enable the monitoring of your recording input through Vegas Pro software while you are recording. |

### Adjusting the playback buffering slider

The playback buffer controls how much memory is used when playing back your project. This preference is useful, but must be carefully adjusted. If you set the buffer size too high, you may experience gapping during playback. Conversely, if you set the buffer size too low, you may experience gapping as well because Vegas Pro software has too little memory to work with during playback.

The playback buffer slider should be set to balance RAM usage and playback buffering. The rule is to set this slider as low as possible without introducing gapping.

1. Open a project that has multiple events.
2. On the **Audio device** tab, move the **Playback buffering (seconds)** slider to **0.25**.
3. Start playing back the project.
4. If the playback still gaps, increase the **Playback buffering (seconds)** slightly.

You may have to experiment to find the correct settings. If you continue to experience gapping, you can try the following to control the gapping:

- Decrease the number of events you are trying to play back. This may mean muting tracks or soloing a couple of tracks. RAM is mostly affected by the number of unique events that are playing back simultaneously.
- Use the **Render to New Track** command (on the **Tools** menu) to combine all the events into one event. *For more information, see Rendering to a new track on page 161.*

### MIDI tab

Use the **MIDI** tab to set options for using MIDI devices with Vegas Pro software. To display this tab, choose **Preferences** from the **Options** menu, then click the **MIDI** tab.

| Preference | Description |
|---|---|
| **Make these devices available for MIDI output** | Select the check box for each MIDI device that you want to use as a MIDI output for a control surface. |
| **Make these devices available for MIDI input** | Select the check box for each MIDI device that you want to be available for a control surface. |
| **Default All** | Restores all MIDI preferences to the default settings. |

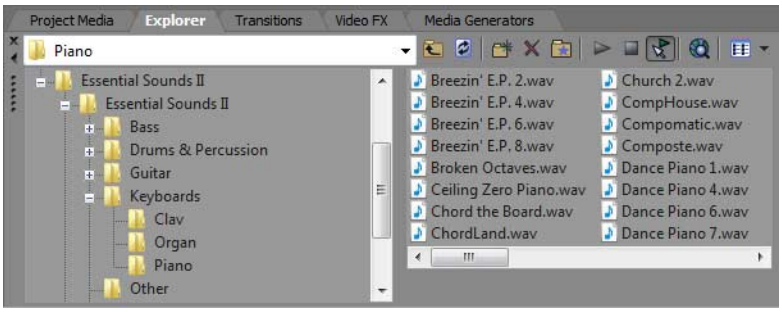
### VST Effects tab

| Preference | Description |
|---|---|
| **Default VST search folder** | Displays the location where the software looks for VST effects. |
| **Alternate VST search folder** | Click **Browse** to choose an alternate location where VST effects can be found. |
| **Select VST effects to be available as audio plug-ins** | Select the VST effects that you want available for use as Vegas Pro audio plug-ins. Only the VST effects located in the default or alternate search folders appear in this box. |

## Editing tab

| Preference | Description |
|---|---|
| **Enable looping on events by default** | Sets events that are trimmed longer than their source media to automatically loop. When this option is not selected, extended events repeat the final frame of a video file. |
| **Preserve pitch when stretching audio events** | Prevents pitch shifting when you stretch an audio event. |
| **Collapse loop region when no time selection is present** | When selected, a loop region does not persist when there is no time selection. This means that when you click the timeline and move the cursor (destroying the any previous time selection), the loop region is also reset to zero. By default, this option is not selected and loop regions persist until modified or until a new time selection is created. |
| **Cut, copy, and delete grouped events** | When this check box is selected, cutting, copying, or deleting an event will affect all events in the same group. |
| **Do not quantize to frames for audio-only edits** | When this check box is selected, audio-only edits (event moves, trims, and ASR times) are not quantized even if **Quantize to Frames** is enabled. *For more information, see Quantizing to frames on page 102.* |
| **JKL/shuttle speed** | Choose a setting from the drop-down list to set the speed that will be used for scrubbing the timeline with the JKL keys or with a multimedia controller. |
| **Quick fade length for audio events (ms)** | Sets a fast fade on the edges of audio events (10ms by default) to soften potentially harsh beginnings and endings. |
| **New still image length (seconds)** | Sets the default duration of inserted still image files (for example, .bmp and .png files). |
| **Default time between CD tracks** | Sets the default time created between CD tracks when using the **Add Media as CD Tracks** command in the Project Media window. *For more information, see Adding media as CD tracks to a new project on page 389.* |
| **Cursor preview duration (seconds)** | Enter a value in the edit box to specify the length of the time Vegas Pro software will preview when you preview the cursor.<br>To preview the cursor, press the 0 key on the numeric keypad. Vegas Pro software creates a temporary selection (centered over the cursor) and begins playback automatically.<br>Cursor preview will loop if the Loop Playback mode is enabled. |
| **Automatically overlap multiple selected media when added** | Creates automatic crossfades between events when multiple media files are added to the same track across time. When this check box is not selected, multiple media files are added end-to-end across time with no overlap. *For more information, see Creating a slide show on page 272.* |
| **Cut-to-overlap conversion (seconds)** | Sets the behavior of the cut-to-overlap feature. The cut-to-overlap feature allows you to transform a cut from one event to another into a transition. The **Amount** field sets the duration of the extended overlap. The **Alignment** value determines the direction of the extension. *For more information, see Converting a cut to a transition on page 327.* |
| **Time selection envelope fades (ms)** | When this check box is selected, all envelope points within a time selection are adjusted as you drag, and fades are applied to the beginning and end of the selection. Additional envelope points are created as necessary. Clear this check box if you want to edit envelope points individually. *For more information, see Applying envelope fades within a time selection on page 173.* |
| **Automatically crop still images added to timeline** | When this check box is selected, Vegas Pro software automatically crops still images you add to the timeline to match the project frame size. *For more information, see Automatically cropping still images added to the timeline on page 271.* |
| **Default All** | Restores all editing preferences to the default settings. |

## Display tab

| Preference | Description |
|---|---|
| **Track colors** | Use these controls to change the default colors used to display tracks in your project.<br>Select a track from the **Track** drop-down list, and then click the color swatch to display a color picker.<br>You can choose any color using the RGBA or HSLA controls. Click the **Change Color Space** button ( ) to switch between RGB and HSL color modes, or click the **Pick Color from Screen** button ( ) to sample a color from your screen.<br>When you click **OK** or **Apply**, all tracks that used the selected color are updated. |
| **Envelope colors** | Use these controls to change the default colors used to display envelopes in the timeline.<br>Choose an envelope type from the **Envelope type** drop-down list and click the color swatch to display a color picker, where you can choose any color using the RGBA or HSLA controls. Click the **Change Color Space** button ( ) to switch between RGB and HSL color modes, or click the **Pick Color from Screen** button ( ) to sample a color from your screen. |
| **Snap colors** | Use these controls to change the default colors used to snapping indicators in the timeline.<br>Choose an snap indicator type from the **Snap type** drop-down list and click the color swatch to display a color picker, where you can choose any color using the RGBA or HSLA controls. Click the **Change Color Space** button ( ) to switch between RGB and HSL color modes, or click the **Pick Color from Screen** button ( ) to sample a color from your screen. |
| **Icon color saturation** | Drag the slider to adjust the color intensity of icons in the Vegas Pro window. Drag to the left to decrease the color saturation, or drag to the right to increase it. |
| **Icon color tint** | Drag the slider to adjust the amount of tinting that is applied to the icons in the Vegas Pro window. Drag the slider to the right to add an average of the title bar colors to the icons. Drag to the left to decrease the amount of tinting applied. |
| **Use Vegas color scheme** | Select this check box to use the gray Vegas Pro color scheme to draw the interface instead of your Windows theme. Clear this check box to use your Windows theme. *For more information, see Changing the Vegas Pro color scheme on page 401.*<br>**Tip:** *You can also use the* **COLORS** *command line option to start Vegas Pro using the Vegas Pro color scheme or Windows color scheme. For more information, see COLORS on page 400.*<br>**Note:** *If you're using a high-contrast color scheme in Windows, the* **Use Vegas color scheme** *preference and command-line option are ignored.* |
| **Automatically hide docking area** | Select this check box if you want the window docking area to hide automatically when you're not using it. Hover over the top of the Vegas Pro window to show the window docking area.<br>**Note:** *If the* **Display timeline at bottom of main window** *check box is also selected, double-click the splitter above the timeline to make the docking area visible again.* |
| **Display timeline at bottom of main window** | Select this check box if you want to display the timeline at the bottom of the Vegas Pro window. The window docking area will be displayed at the top of the window. |
| **Position tabs at top of docked windows** | Select this check box if you want to display tabs at the top of docked windows:<br>  |
| **Default All** | Restores the Display page options to the default settings. |

### CD Settings tab

The CD Settings tab allows you to set preferences for burning discs and extracting audio from your own CDs.

| Preference | Description |
|---|---|
| **Use strict Red Book specification for DAO validation** | Select this check box if you want to be notified prior to burning a disc-at-once CD if anything about your CD project is against strict Red Book standards.<br>These warnings are not critical, and in most cases you will not write an unreadable disc if you proceed. Clearing this check box will not suppress critical warnings that will result in an unreadable disc. |
| **Include wide SCSI devices when searching for drives** | Select this check box if you want Vegas Pro software to scan for wide SCSI disc drives when you attempt to extract data from or burn discs.<br>When the check box is cleared, Vegas Pro software will not scan for wide SCSI devices, which can increase compatibility with some USB device drivers that incorrectly identify themselves as wide SCSI. |
| **Skip drive database; autodetect drive capabilities on startup** | When the check box is cleared, Vegas Pro software will use an internal configuration file to determine your drive's capabilities.<br>If you encounter problems burning discs, select this check box, and Vegas Pro software will test your drive to determine its capabilities. |
| **Use SPTI direct** | Select this check box if you want to use SPTI (SCSI Pass-Through Interface) to communicate with your disc burning drive. |
| **Use legacy disc drivers** | Select this check box to use the legacy Vegas Pro disc drivers for burning discs<br>Clear this check box to use the Microsoft Image Mastering API (IMAPI) disc drivers to burn discs in Vegas Pro software. This can be useful if burning discs with the legacy disc drivers is not working as you expect. |
| **Default All** | Restores all CD preferences to the default settings. |

### Sync tab

These preferences are used to set up Vegas Pro software to generate or trigger from MIDI timecode from external MIDI devices. *For more information, see* *Synchronizing MIDI timecode on page 238*.

| Preference | Description |
|---|---|
| **Generate MIDI Timecode settings** | Sets the output device and frame rate used when generating MIDI timecode. |
| **Generate MIDI Clock settings** | Sets the output device used when generating MIDI Clock information. You can choose the same device that you chose for **Generate MIDI Timecode settings**. |
| **Trigger from MIDI Timecode settings** | Sets the input software or device and frame rate used when triggering from MIDI timecode. |

**Note:** *When Sync is active (Vegas Pro software is triggering from MTC), media files are not closed (that is, cannot be edited outside of Vegas Pro software) when Vegas Pro software is not the active application. You will also not be prompted to rename or delete recorded takes as this may interrupt the synchronization.*

#### Setting advanced Sync preferences

From the **Sync** tab, you can access advanced settings by clicking **Advanced**. The Advanced Sync Preferences dialog has three tabs: **MTC Input**, **MTC Output**, and **MIDI Clock Output**. The display of these tabs is dependent on your selections in the Sync tab. See the following sections on each tab for more information.

### MTC Input tab

This tab appears only if you choose a device in the **Trigger from MIDI Timecode settings** drop-down list on the **Sync** tab.

| Preference | Description |
|---|---|
| **Free-wheel for timecode loss** | When selected, Vegas Pro software continues to play for a specified period of time without chasing if timecode is lost. Enabling this option can compensate for infrequent losses in timecode monitoring. If losses in timecode are frequent, troubleshooting should be done on your hardware to find the cause of the problem. |
| **Free-wheel slack time (seconds)** | Specifies the amount of time that timecode can be lost before the **Free-wheel playback time** starts. A longer time is more tolerant of losses in the incoming timecode. |
| **Free-wheel playback time (seconds)** | Specifies the amount of time that Vegas Pro software plays back after the **Free-wheel slack time** has been exceeded. |
| **Synchronization delay time (seconds)** | Specifies the amount of time required for Vegas Pro software to synchronize itself to incoming timecode. On slower computers, this time should be set to around two seconds. On faster computers, it can be set lower. |
| **Offset adjust (quarter frames)** | If Vegas Pro software is consistently behind or ahead of the MTC generator, enter a value to adjust a synchronization offset with quarter-frame accuracy.<br>If Vegas Pro software is behind the MTC generator, enter a negative number such as -4. If Vegas Pro software is ahead of the MTC generator, enter a positive number such as 4. |

### MTC Output tab

This tab displays only if you choose a device in the **Generate MIDI Timecode settings** drop-down list on the **Sync** tab.

| Preference | Description |
|---|---|
| **Full-frame message generation** | Specifies when Vegas Pro software sends full-frame timecode messages. Full-frame messages are used by some external audio synchronizers to seek a proper location prior to synchronization. For example, tape-based recorders benefit from seeking to full-frame messages because of the time required to move the transport to the proper location. However, full-frame messages are ignored by some devices and may actually cause unexpected behavior in other devices. Check your hardware documentation to find out if it supports full-frame messages. |

### MIDI Clock Output tab

This tab displays only if you choose a device in the **Generate MIDI Clock Settings** drop-down list on the **Sync** tab.

| Preference | Description |
|---|---|
| **Send Start instead of Continue when beginning playback** | When selected, Vegas Pro software sends a Start command rather than a Continue command. Normally, Vegas Pro software sends a Continue command to allow the chasing device to start at a specific time. However, some older MIDI sequencers do not support the Continue command and must start from the beginning every time. |
| **Song Position Pointer generation** | Specifies when Vegas Pro software sends Song Position Pointer messages. Song Position Pointer messages are used by MIDI applications and devices to seek to a proper location prior to starting the synchronization process. |

## External Control & Automation tab

Use the **External Control & Automation** tab to set up and customize control surfaces and adjust settings for automation envelopes. To display this tab, choose **Preferences** from the **Options** menu, then click the **External Control & Automation** tab.

| Preference | Description |
|---|---|
| **Smooth and thin automation data after recording** | When recording automation, Vegas Pro software creates as many envelope points or keyframes as possible to represent your control movements.<br>Select this check box if you want to reduce the number of envelope points/keyframes after recording is finished.<br>*For more information, see Recording automation settings on page 176.* |

| Preference | Description |
|---|---|
| **Set controls to default values when automation is turned off** | Select this check box if you want controls to return to their default values when set the track's automation recording mode to Automation Off. Automated effect parameters do not have default settings and will retain their last-set values when you turn automation off.<br><br>When the check box is cleared, controls will retain their last-set values when you turn automation off. |
| **Available devices** | Choose a device from the drop-down list and click **Add** to choose the control surfaces that will be available to Vegas Pro software. Adding a device loads its default profile. |
| **Active control devices** | Lists the control devices that you've added. Double-click a device name to customize its behavior. |
| **New audio envelopes** | Choose a setting from the drop-down list to set the default fade type that will be used when you add volume and panning envelopes. *For more information, see Volume or pan automation (audio only) on page 164.*<br><br>This setting is used only when you create new envelopes. When you add a point to an existing envelope, the new point always uses the same fade type as the preceding envelope point. |
| **New audio event gain** | Choose a setting from the drop-down list to set the default fade type for the fade-in and fade-out curves on audio event gain envelopes. *For more information, see Using audio event envelopes (ASR) on page 184.*<br><br>This setting is used only for events that you place on the timeline after changing the setting. Existing events will use the default fade type that was active when they were added to the timeline. |
| **New audio FX automation envelopes** | Choose a setting from the drop-down list to set the default fade type that will be used when you add audio effect automation envelopes. *For more information, see Effect automation (audio only) on page 166.*<br><br>This setting is used only when you create new envelopes. When you add a point to an existing envelope, the new point always uses the same fade type as the preceding envelope point. |
| **New video envelopes** | Choose a setting from the drop-down list to set the default fade type that will be used when you add fade-to-color, composite level, transition progress, motion blur, supersampling, and event velocity envelopes. *For more information, see Fade-to-color automation (video only) on page 169, Composite level automation (video only) on page 169, Adding a transition progress envelope on page 326, Adding a motion blur envelope on page 170, Adding a video supersampling envelope on page 170, and Using velocity envelopes on page 187.*<br><br>This setting is used only when you create new envelopes. When you add a point to an existing envelope, the new point always uses the same fade type as the preceding envelope point. |
| **New video event opacity** | Choose a setting from the drop-down list to set the default fade type for the fade-in and fade-out curves on video event opacity envelopes. *For more information, see Using opacity envelopes on page 186.*<br><br>This setting is used only for events that you place on the timeline after changing the setting. Existing events will use the default fade type that was active when they were added to the timeline. |
| **New video FX keyframes** | Choose a setting from the drop-down list to set the default keyframe type that will be used when you add video track effect keyframes. *For more information, see Applying video effects on page 301.*<br><br>This setting is used only when you add new effects. When you add a keyframe to an existing effect, the new keyframe is created as the same type as the preceding keyframe. |
| **New video motion keyframes** | Choose a setting from the drop-down list to set the default keyframe type that will be used when you add track motion, parent track motion, 3D track motion, or pan/crop keyframes. *For more information, see Adding track motion on page 339, 3D compositing on page 310, and Panning and cropping video events on page 263.*<br><br>This setting is used only when you add new effects. When you add a keyframe to an existing effect, the new keyframe is created as the same type as the preceding keyframe. |
| **Track Motion default smoothness** | Type a value in the box (or use the spin control) to set the default **Smoothness** value for track motion and 3D track motion keyframes. *For more information, see Adding track motion on page 339 and 3D compositing on page 310.* |

| Preference | Description |
| --- | --- |
| **Pan/Crop default smoothness** | Type a value in the box (or use the spin control) to set the default **Smoothness** value for event pan/crop keyframes. *For more information, see Panning and cropping video events on page 263.* |
| **Default all** | Restores all control surface preferences to the default settings. |

Appendix A

# Using Hardware Controllers

Vegas® Pro software supports several types of hardware devices you can use to adjust controls in the user interface, from a full-featured, professional control surface to a simple gaming joystick.

A hardware controller lends a tactile element to your editing sessions, providing a hands-on feel that your mouse just can't duplicate.

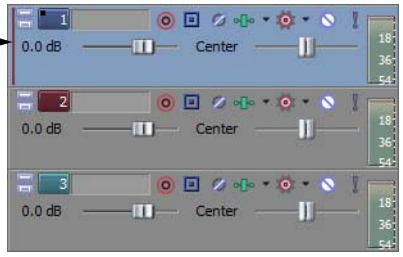
## Using a control surface

A control surface is a hardware device that uses knobs, faders, and buttons to control user interface elements that are normally controlled with a mouse. Using a control surface lends a tactile feel to your editing sessions.

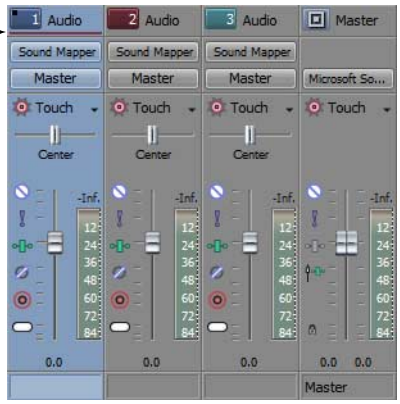
Unlike keyboard shortcuts—which determine the shortcut's behavior based on the portion of the Vegas Pro window that has focus—a control surface's mapped functions work no matter what part of the application has focus.

When your control surface is enabled, an indicator is displayed in the track list and the Mixing Console to indicate which channels are under external control. Multiple bars are displayed if a channel is under the control of multiple devices.

In the track list, the vertical bar in track 1 indicates that track is under external control.




In the Mixing Console, the horizontal bar at the top of channel 1 indicates that channel is under external control.




### Connecting your control surface

You can use one Mackie Control Universal (with up to four Mackie Control Universal Extenders), one Frontier TranzPort, and up to five generic control surfaces with Vegas Pro.

If you're using Mackie Control Extenders, you'll need a multiport MIDI interface with MIDI In/Out ports for each device.

Perform the following steps for each device.

1. Connect the MIDI Out port on your MIDI interface to the MIDI In port on your control surface.
2. Connect the MIDI In port on your MIDI interface to the MIDI Out port on your control surface.
3. If you're using Mackie Control Extenders, repeat Steps 1 and 2 for each Mackie Control Extender.

**Note:** *If you're using a USB interface such as the Frontier TranzPort, just plug in the USB cable.*

### Configuring Vegas Pro software to use your control surface

Use the MIDI tab in the Preferences dialog to select the device to which your control surface is connected.

1. From the **Options** menu, choose **Preferences** to display the Preferences dialog.
2. Enable your MIDI input and output ports:
   a. Select the **MIDI** tab in the Preferences dialog.
   b. In the **Make these devices available for MIDI output** box, select the check box for the MIDI port that is connected to your control surface's In port.
   c. In the **Make these devices available for MIDI input** box, select the check box for the MIDI port that is connected to your control surface's Out port.
   d. Click **Apply**.
3. Choose your control surface:
   a. Select the **External Control & Automation** tab in the Preferences dialog.
   b. Choose a device from the **Available devices** drop-down list and click the **Add** button. Adding a device loads its default profile. If you want to customize the behavior of the control surface, double-click its entry in the **Active control devices** list.
4. Click **OK** to apply your changes and close the Preferences dialog.

### Configuring or customizing your control surface

Use the **External Control & Automation** tab in the Preferences dialog to select the control surfaces you want to use and adjust their configuration.

1. From the **Options** menu, choose **Preferences** to display the Preferences dialog.
2. Select the **External Control & Automation** tab.
3. Choose a device from the **Available devices** drop-down list and click the **Add** button. The device is added to the **Active control devices** list.
4. Double-click the entry in the **Active control devices** list to display the configuration dialog.
   - *For more information about setting up a Mackie control, see Using a Mackie Control Universal with Vegas Pro on page 435.*
   - *For more information about setting up a Frontier TranzPort, see Using a Frontier TranzPort on page 451.*
   - *For more information about setting up a PreSonus FaderPort, see Using a PreSonus FaderPort on page 452.*
   - *For more information about setting up a generic MIDI control, see Using a generic control surface on page 454.*

### Using your control surface

This section describes how to use your control surface in general terms.

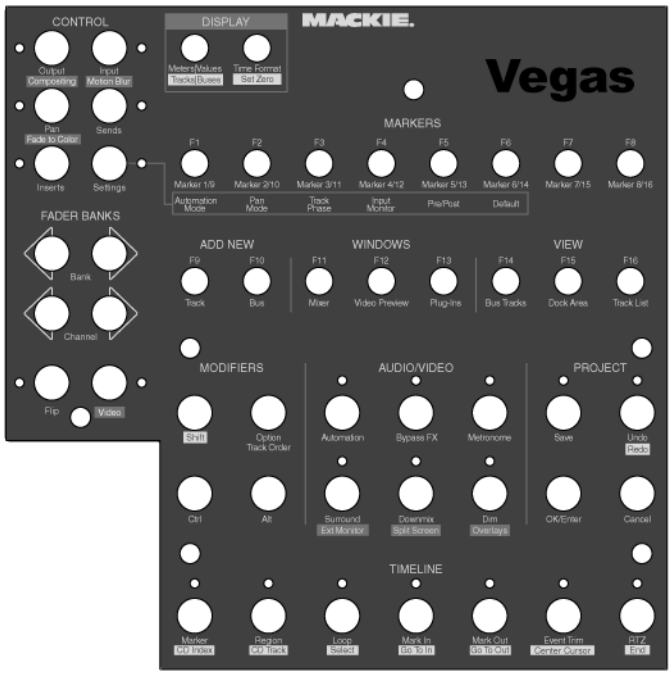
For information about your specific device, refer to the manufacturer's documentation.

1. From the **Options** menu, choose **External Control** to enable your selected control surfaces.
2. If necessary, press the **Automation** button on your control surface.
3. Click the **Automation Settings** button ( ) for each track you want to edit with the control surface and choose **Automation Write (Touch)** or **Automation Write (Latch)** to enable automation recording.

   To enable automation recording for audio busses or the main video output, use audio bus tracks or the video bus track.
4. Use the functions on your control surface to edit your project.

## Using a Mackie Control Universal with Vegas Pro

The Mackie Control is fully supported by Vegas Pro (versions 5 and later) software and lends a tactile element to your editing sessions. An overlay is available from Mackie that you can use to label the Mackie Control buttons and controls with their mapped functions in Vegas Pro. For more information about Mackie Control overlays, check the Mackie Web site: *http://www.mackie.com/products/mcu/index.html*




The overlay identifies the default control mapping. You can also customize the buttons and controls on the Mackie control. *For more information, see* *Configuring or customizing control mappings on page 438*. When you use the default mapping, the Mackie Control is divided into several functional areas. All functionality described in this document refers to the default control mapping.

### Hardware setup

You can use one Mackie Control Universal (with up to four Mackie Control Extenders) with Vegas Pro. Perform the following steps for each device.

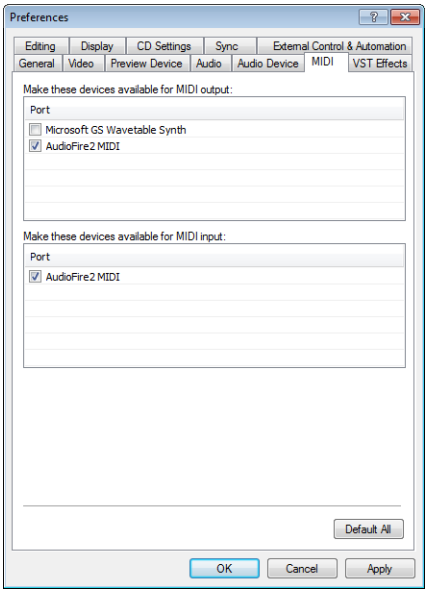
If you're using Mackie Control Extenders, you'll need a multiport MIDI interface with MIDI In/Out ports for each device.

#### Connecting the Mackie Control Universal

1. Connect the MIDI Out port on your MIDI interface to the MIDI In port on your Mackie Control Universal.
2. Connect the MIDI In port on your MIDI interface to the MIDI Out port on your Mackie Control Universal.
3. Repeat Steps 1 and 2 for each Mackie Control Extender.

### Configuring the software to use the Mackie Control Universal

1. From the Options menu, choose **Preferences** to display the Preferences dialog.
2. Enable your MIDI input and output ports:
   a. Select the MIDI tab in the Preferences dialog.




   b. In the **Make these devices available for MIDI output** box, select the check box for the MIDI port that is connected to the Mackie Control Universal's In port.
   c. In the **Make these devices available for MIDI input** box, select the check box for the MIDI port that is connected to your Mackie Control Universal's Out port.
   d. Repeat Steps 2b and 2c for each Mackie Control Extender.
   e. Click **Apply**.
3. Choose your control surface:
   a. Select the External Control and Automation tab in the Preferences dialog.
   b. From the **Available devices** drop-down list, choose **Mackie Control** and click the **Add** button to load the default profile.
4. Click **OK** to apply your changes and close the Preferences dialog.
5. From the Options menu, choose **External Control** to enable the Mackie Control Universal.

### Configuring channel mappings for Mackie Control Extenders

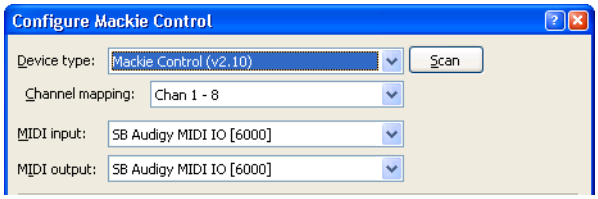
If you're using Mackie Control Extenders, you'll need to set up your channel mapping. Channel mapping tells the software how the devices are arranged on your desktop.

For example, if your Mackie Control Universal is on the left of your Mackie Control Extender, you could configure the Mackie Control to adjust channels 1 through 8 and use the Mackie Control Extender to adjust channels 9 through 16. If you have a Mackie Control Universal positioned between two Mackie Control Extenders, you could adjust channels 1 through 8 on the left Extender, adjust channels 9 through 16 on the Mackie Control Universal, and adjust channels 17 through 24 on the right Extender.

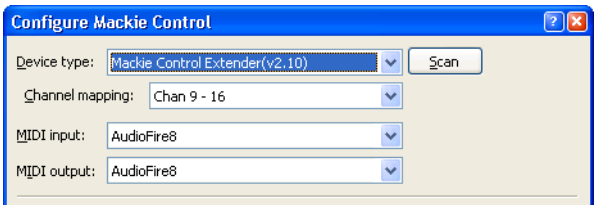
1. From the Options menu, choose **Preferences** to display the Preferences dialog.
2. Select the External Control & Automation tab.
3. Double-click your Mackie Control in the **Active control devices** list to display the Configure Mackie Control dialog.

   The current channel mapping is displayed on each device's LCD.

4. Choose the channels you want to control with the Mackie Control Universal:
   a. From the **Device Type** drop-down list, choose **Mackie Control**.
   b. From the **Channel Mapping** drop-down list, choose the channels you want to adjust with the Mackie Control Universal.




5. Choose the channels you want to control with the Mackie Control Extender:
   a. From the **Device Type** drop-down list, choose **Mackie Control Extender**.
   b. From the **Channel Mapping** drop-down list, choose the channels you want to adjust with the Mackie Control Extender.



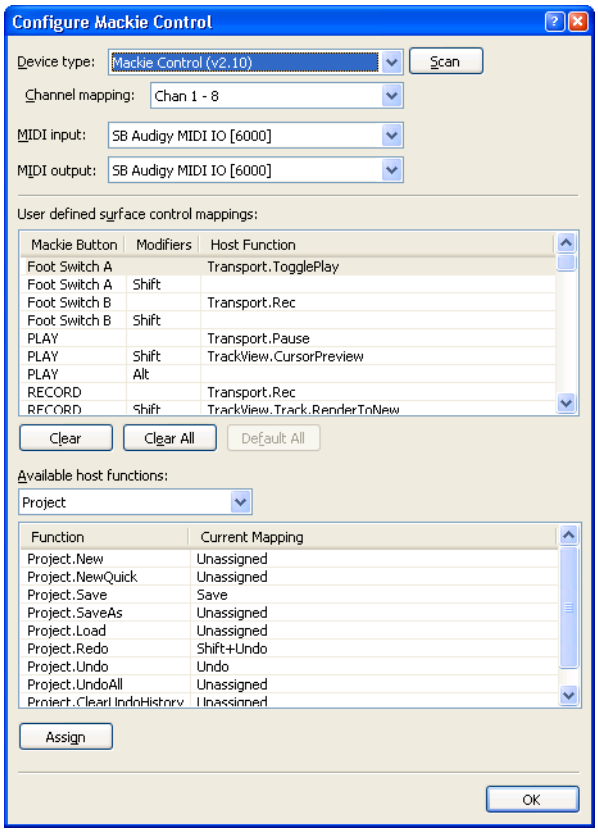

6. Repeat Step 5 for each Mackie Control Extender.
7. Click **OK** to apply your changes and close the Configure Mackie Control dialog.
8. Click **OK** to apply your changes and close the Preferences dialog.

### Configuring or customizing control mappings

Use the **External Control & Automation** tab in the Preferences dialog to select the control surfaces you want to use and adjust their configuration.

> **Reminder:** *When you customize your control mappings, button functions may not match the labels on the overlay. You can click the* **Default All** *button in the Configure Mackie Control dialog to restore the default settings.*

1. From the **Options** menu, choose **Preferences** to display the Preferences dialog.
2. Select the **External Control & Automation** tab.
3. Double-click your Mackie Control in the **Active control devices** list to display the Configure Mackie Control dialog.




4. To add or change a function do the following:
   a. Select an item in the **User defined surface control mappings** list.
   b. Select an item in the **Available host functions** list.
   c. Click the **Assign** button.
5. To remove a function, select an item in the **User defined surface control mappings** list and click the **Clear** button.
6. To remove all functions, click the **Clear All** button.
7. To replace all custom functions with the default settings, click the **Default All** button.

### Using the Mackie Control Universal

The following sections describe the default control mapping for the Mackie Control Universal when used with Vegas Pro.

**Note:** *The Mackie Control Universal can control either trim or automation settings. In order to control automation settings, the Automation Settings button ( ) in the Audio/Video section must be selected, and the track or bus you want to edit must be set to* **Automation Write (Touch)** *or* **Automation Write (Latch)**. *Hold the F1 button while turning the V-Pot (or use the Automation Settings button) to change the automation recording mode for each track and bus track.*

#### Channel section

The channel section includes V-Pots (knobs), buttons, and faders that you can use to edit your tracks and busses.

If you're using Mackie Control Extender units, you can control eight additional channels with each Extender. *For more information, see* *Configuring channel mappings for Mackie Control Extenders on page 436*.

| Item | Description |
|---|---|
| 1 V-Pot | Adjusts values for panning, volume (when **Flip** button is selected), video track opacity (when **Flip** button is selected), video track fade-to-color, and effect parameter values.<br>• **Audio track volume** Adjusts track volume when the **Pan** or **Sends** button is selected and the **Flip** button is selected.<br>• **Audio track panning** Adjusts audio track panning when the **Pan** button is selected.<br>• **Bus send levels** Adjusts bus send levels when the **Sends** button is selected.<br>• **Video track opacity** Adjusts video track opacity when the **Video** and **Flip** buttons are selected.<br>• **Video track fade to color** Adjusts video track fade-to-color envelope when the **Video** button is selected, the **Automation** button in the Audio/Video section is selected, and the track is in Automation Write (Touch) or Automation Write (Latch) mode.<br>• **Compositing mode** Adjusts the track compositing mode when the **Video** button is selected and you press the **Output/Compositing** button twice to change the track assignment to CO.<br>• **Effect parameters** Adjusts effect parameters when the **Inserts** button is selected.<br>The V-Pot is velocity sensitive, so rotating quickly changes values quickly, and you can press the button to choose a selection.<br>When the **Pan** or **Sends** button is selected, press the V-Pot to edit the track or bus chain. |
| 2 Rec/Ready Button | Arms audio tracks for recording. |

| Item | | Description |
|---|---|---|
| 3 | Signal LED | Indicates whether an audio track or bus is outputting a signal. |
| 4 | Solo Button | Press to solo a track or remove it from the solo group. |
| 5 | Mute Button | Press to mute or unmute a track. |
| 6 | Select Button | Press to select a track. |
| 7 | Fader | Adjusts the track or bus level (unless the **Flip** button is selected).<br>When the **Automation** button is selected, the fader adjusts the automation envelope if the track is in Automation Write (Touch) or Automation Write (Latch) mode.<br>The fader can also adjust settings for the following items when you select other buttons in the Channel section.<br>• **Audio track panning** Adjusts audio track panning when the **Pan** and **Flip** buttons are selected.<br>• **Bus send levels** Adjusts bus send levels when the **Sends** and **Flip** buttons are selected.<br>• **Video track opacity** Adjusts video track opacity when the **Video** button is selected.<br>• **Video track fade to color** Adjusts video track fade-to-color settings when the **Automation**, **Video**, and **Pan/Fade to Color** buttons are selected.<br>Adjusts video track fade-to-color envelope when the following conditions are met:<br>• The **Video** button is selected.<br>• The **Automation** button in the Audio/Video section is selected.<br>• The **Pan/Fade to Color** button is selected.<br>• The track is in Automation Write (Touch) or Automation Write (Latch) mode.<br>The fader is touch sensitive, so if you're recording automation parameters, recording will begin when you touch the fader and stop when you release it. The current setting is displayed in the Mackie Control display. |

### Footswitches (not shown)

The Mackie Control has two switched inputs (labeled User Switch A and User Switch B) that you can use to connect footswitches.

By default, footswitch A toggles playback, and footswitch B starts and stops recording.

You can customize the footswitches in the Configure Mackie Control dialog. Double-click Mackie Control in the **Active control devices** list on the External Control & Automation tab of the Preferences dialog to display the Configure Mackie Control dialog. *For more information, see Configuring or customizing control mappings on page 438.*

### Control buttons

The buttons in the Control section determine the operation of the V-Pots and faders in the channel section of your Mackie Control. In every mode, the fader adjusts track volume, and the V-Pot adjusts the selected control mode. You can press the **Flip** button to reverse the V-Pot and fader function.

| Item | | Description |
|---|---|---|
| 1 | Output/ Compositing | Press the **Output** button to set the output device for each track or bus. Turn the V-Pot in the channel section to choose an output device and press the V-Pot to select it.<br>When the **Video** button is selected, you can set the compositing mode for each track using the V-Pot. |
| 2 | Input/ Motion Blur | Press to set the recording input device for each track. Turn the V-Pot in the channel section to choose an input device and press the V-Pot to select it.<br>When the **Video** button is selected, press the V-Pot to enable or bypass motion blur for each video track. |

| Item | Description |
|---|---|
| 3 Pan/Fade to Color | Press to adjust track panning using the V-Pot in the channel section.<br>In 5.1 surround projects, pressing the **Pan** button toggles left-to-right panning, front-to-rear panning, and center-channel level adjustment using the V-Pot.<br>When the **Video** button is selected, you can adjust the opacity of video tracks with the fader in the channel section and adjust fade-to-color settings with the V-Pot when the **Automation** button in the Audio/Video section is selected and the track is in **Automation Write (Touch)** or **Automation Write (Latch)** mode. |
| 4 Sends | Press to adjust bus and assignable effects send levels. Press the **Sends** button to scroll through the available busses and assignable effects chains, and then turn the V-Pot to adjust the send level. |
| 5 Inserts | Press to adjust effects settings.<br>Press the button once to display **PL** in the Mackie Control Assignment display. The Mackie Control LCD displays the effects that are assigned to each track or bus. The following example shows a three-track project:<br>`Aud1  Aud2  Aud3  Master`<br>`TrNsGt TrcCmp TrcEQ  (None)`<br>Turn the V-Pot to scroll through the effects, and press the V-Pot to edit the current effect. In editing mode, **PE** is displayed in the Assignment display. The following example shows the settings for the Noise Gate plug-in on track one:<br>`ThrLvl AttTim RlsTim Bypass\|Aud1  Track Noise Gate`<br>`-80.0  2.90  100.0  False\| 1/1  *Noise gate 1`<br>PE mode uses the following controls:<br>• **V-Pots 1-4:** Turn to edit the effect's parameters. For "switch" parameters such as Bypass, press the V-Pot to change the setting.<br>• **V-Pot 5:** Turn to scroll through an effect's property pages.<br>• **V-Pot 6:** Turn to choose from a plug-in's available presets. Press the V-Pot to choose a preset.<br>• **V-Pot 7:** Turn to edit the current effect for a different channel.<br>• **V-Pot 8:** Turn to choose other effects for the current channel.<br>Press the **Inserts** button again to view effects chains. **PS** is displayed in the Assignment display. The following example shows the effects chain on track one:<br>`\|Aud1`<br>`TrckNoisGate  Track EQ  TrackCmprss  \| 1/2`<br>PS mode uses the following controls:<br>• **V-Pots 1, 3, and 5:** Turn to choose other effects for the current channel. Press to edit the selected effect and enter PE mode.<br>• **V-Pots 2, 4, and 6:** After choosing an effect with V-Pot 1, 3, or 5, press V-Pot 2, 4, or 6 to add it to the channel.<br>• **V-Pot 7:** If a channel has multiple pages of effects in the chain, turn to display additional effects. In the previous example, **Aud 1 1/2** means that track one has two pages of effects.<br>• **V-Pot 8:** Turn to choose effects chains for other channels.<br>When **<No Insert>** is displayed above a V-Pot, you can turn the V-Pot to view effects that you can add to the chain. New effects are displayed with a *. Press the next V-Pot (to the right) to add the effect. |
| 6 Settings | Press to adjust track or bus settings using the F1 through F6 buttons.<br>• **F1:** Hold the button and turn the V-Pot to change the automation recording mode for each track and bus track.<br>• **F2:** Hold the button and turn the V-Pot to change the current panning mode.<br>• **F3:** Hold the button and press the V-Pot to change the track phase.<br>• **F4:** Hold the button and turn the V-Pot to change record input monitoring settings when you're using an ASIO audio device.<br>• **F5:** When the **Pan** button is selected, press the **Settings** button and then hold F5 while pressing the V-Pot to change the bus or assignable effects output fader to Pre FX or Post FX.<br>When the **Sends** button is selected, press the **Settings** button and hold F5 while pressing the V-Pot to change a track's bus or assignable effects send level to Pre Volume or Post Volume. Press the **Sends** button to scroll through the available bus and effects sends.<br>• **F6:** Press the **Settings** button and hold F6 while pressing the V-Pot on a channel to return the channel's settings to the track defaults. |

### Fader Banks buttons

The Fader Banks buttons control the behavior of the channel section controls.

| Item | Description |
|---|---|
| 1 Bank | Press the left or right arrow button to scroll the channels 8 units at a time.<br>For example, if tracks 1-8 are currently displayed, pressing the right arrow will change to tracks 9-16. |
| 2 Channel | Press the left or right arrow button to scroll the channels 1 unit at a time.<br>For example, if tracks 1-8 are currently displayed, pressing the right arrow will change to tracks 2-9.<br>Hold the **Option** button while pressing either **Channel** button to change track order. For example, if track two is selected and you press **Option**+ < **Channel**, track two becomes track one. Conversely, if track one is selected and you press **Option** + **Channel** >, track one becomes track two. |
| 3 Flip | Press to exchange the behavior of the fader and V-Pot when allowed. |
| 4 Video | Press to toggle audio and video modes.<br>For example, you press the **Pan/Fade** button in audio mode, you can perform audio track panning with the V-Pot.<br>If you press the button in video mode, you can adjust fade-to-color settings if the **Automation** button in the Audio/Video section is selected and the track is in **Automation Write (Touch)** or **Automation Write (Latch)** mode. |

### Display buttons

The Display buttons control the behavior of the channel section controls.

| Item | Description |
|---|---|
| 1 Meters/ Values | When you're working with audio tracks or busses, press to display meters or numeric values. Even in Meters mode, numeric values are displayed when you edit a value.<br>In Audio mode, hold the **Shift** button in the Modifiers section while pressing the **Meters/Values** button to toggle control of tracks, busses, or tracks and busses.<br>• Press once to show audio tracks.<br>• Press again to show audio tracks.<br>• Press again to show busses.<br>• Press again to show tracks and busses. |
| 2 Time Fmt Zero | Press and hold to display the current time format. Turn V-Pot 8 while holding the button to change the format.<br>Hold the **Shift** button in the Modifiers section while pressing the **Time Fmt/Zero** button to set the current cursor position to zero. |

### Markers buttons

The Markers buttons control additional track and channel settings.

| Item | Description |
|---|---|
| 1 Marker 1/9 Automation Mode | Press to place the cursor at marker 1, or hold Shift and press to place the cursor at marker 9.<br>When the **Settings** button is selected, hold the button and turn the V-Pot to change the automation recording mode for each track and bus track. |
| 2 Marker 2/10 Pan Mode | Press to place the cursor at marker 2, or hold Shift and press to place the cursor at marker 10.<br>When the **Settings** button is selected, hold the button and turn the V-Pot to change the current panning mode. |
| 3 Marker 3/11 Track Phase | Press to place the cursor at marker 3, or hold Shift and press to place the cursor at marker 11.<br>When the **Settings** button is selected, hold the button and press the V-Pot to change the track phase. |
| 4 Marker 4/12 Input Monitor | Press to place the cursor at marker 4, or hold Shift and press to place the cursor at marker 12.<br>When the **Settings** button is selected, hold the button and turn the V-Pot to change record input monitoring settings when you're using an ASIO audio device. |
| 5 Marker 5/13 Pre/Post | Press to place the cursor at marker 5, or hold Shift and press to place the cursor at marker 13.<br>When the **Pan** button is selected, press the **Settings** button and then hold F5 while pressing the V-Pot to change the bus or assignable effects output fader to Pre FX or Post FX.<br>When the **Sends** button is selected, press the **Settings** button and hold F5 while pressing the V-Pot to change a track's bus or assignable effects send level to Pre Volume or Post Volume. Press the **Sends** button to scroll through the available bus and effects sends. |
| 6 Marker 6/14 Default | Press to place the cursor at marker 6, or hold Shift and press to place the cursor at marker 14.<br>Press the **Settings** button and hold F6 while pressing the V-Pot on a channel to return the channel's settings to the track defaults. |
| 7 Marker 7/15 | Press to place the cursor at marker 7, or hold Shift and press to place the cursor at marker 15. |
| 8 Marker 8/16 | Press to place the cursor at marker 8, or hold Shift and press to place the cursor at marker 16. |

### Add New buttons

The Add New buttons add busses or tracks to your project.

| Item | Description |
|---|---|
| 1 Track | Press to add a new audio track. When the **Video** button is selected, a new video track is added. |
| 2 Bus | Press to add an audio bus to your project. |

### Windows buttons

The Windows buttons control the display of various Vegas Pro windows.

| Item | Description |
|---|---|
| 1 Mixer | Press to show the Mixer window. If the window is not docked, pressing the button shows/hides the window. |
| 2 Video Preview | Press to show the Video Preview window. If the window is not docked, pressing the button shows/hides the window. |
| 3 Plug-Ins | Press to show the Plug-In Manager window. If the window is not docked, pressing the button shows/hides the window. |

### View buttons

The View buttons control the display of various sections of the Vegas Pro window.

| Item | Description |
|---|---|
| 1 Bus Tracks | Press to show or hide audio bus tracks in the Vegas Pro timeline.<br>When the **Video** button is selected, press to show or hide the video bus track. |
| 2 Dock Area | Press to show or hide the Window Docking Area at the bottom of the Vegas Pro window. |
| 3 Track List | Press to show or hide the track list in the timeline. |

### Modifiers buttons

The Modifiers buttons extend the functionality of other buttons on the Mackie Control.

| Item | Description |
|---|---|
| 1 Shift | Hold the **Shift** button while pressing a button labeled with inverse text to perform the shift function.<br>For example, hold **Shift** while pressing the Undo/Redo button to reverse an undo action. |
| 2 Option/Track Order | Hold the **Option/Track Order** button while pressing a button in the Settings, Add New, or Windows group for alternative functions.<br>Hold the **Option/Track Order** button while pressing a the **Channel** < or **Channel** > button to change track order.<br>Hold the **Option/Track Order** button while pressing F1 to F16 to perform custom functions you can define.<br>*For more information, see Configuring or customizing control mappings on page 438.* |
| 3 Ctrl | Hold the **Ctrl** button while using a control for alternative functions. |
| 4 Alt | Hold the **Alt** button while using a control for alternative functions.<br>Hold **Alt** while pressing F1 through F10 to run scripts 1-10 from the Tools > Scripting submenu. |

### Audio/Video buttons

The Audio/Video buttons control various audio and video settings for your project.

| Item | Description |
|---|---|
| 1 Automation | Press to place the controls on the Mackie Control in automation mode. The controls in the channel section of the Mackie Control will affect the automation parameters on the track or bus if Automation Write (Touch) or Automation Write (Latch) mode is selected.<br>When the button is not selected, the buttons control trim (static) values. |
| 2 Bypass FX | Press to bypass/enable all audio effects. |
| 3 Metronome | Press to turn the metronome on or off. |

| Item | Description |
|---|---|
| 4 Surround/ Ext Monitor | Press to toggle the project properties between stereo and 5.1 surround mode.<br>When the **Video** button is selected, press the **Surround/Ext Monitor** button to send your video preview to an external monitor. |
| 5 Downmix/ Split Screen | Press to toggle the state of the **Downmix Output** button in the Mixer window.<br>When the **Video** button is selected, press the **Downmix/Split Screen** button to toggle split-screen video previews. |
| 6 Dim/ Overlays | Press to toggle the state of the **Dim Output** button in the Mixer window.<br>When the **Video** button is selected, press the **Dim/Overlays** button to toggle the display of overlays (grid, safe areas, and RGB channels) in the Video Preview window. |

### Project buttons

The Project buttons perform various project-level commands.

| Item | Description |
|---|---|
| 1 Save | Press to save your project. |
| 2 Undo/Redo | Press to reverse edit operations.<br>Hold **Shift** while pressing the button to reverse an undo operation. |
| 3 OK | Not used. |
| 4 Cancel | Not used. |

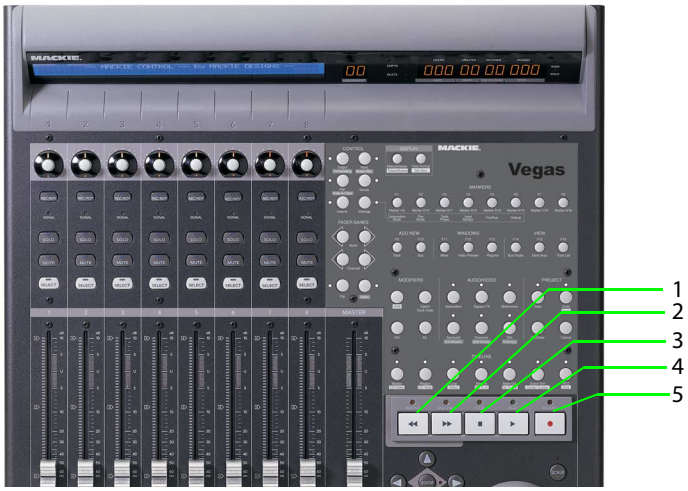
### Timeline buttons

The Timeline buttons perform various commands for the project timeline.

| Item | Description |
|---|---|
| 1 Marker/ CD Index | Press to place a marker at the cursor position.<br>Hold the **Shift** button while pressing the **Marker/CD Index** button to place a CD index marker at the cursor position.<br>Hold the **Ctrl** button while pressing the **Marker/CD Index** button to remove a marker.<br>Hold the **Ctrl** and **Shift** buttons while pressing the **Marker/CD Index** button to remove a CD index marker. |
| 2 Region/ CD Track | Press to convert the current selection to a region.<br>Hold the **Shift** button while pressing the **Region/CD Track** button to convert the current selection to a CD track region.<br>Hold the **Ctrl** button while pressing the **Region/CD Track** button to remove a region.<br>Hold the **Ctrl** and **Shift** buttons while pressing the **Region/CD Track** button to remove a CD track. |
| 3 Loop/ Select | Press to toggle looped playback mode.<br>Hold the **Shift** button while pressing the **Loop/Select** button to create a time selection from the loop region. |
| 4 Mark In/ Go to In | Press to set the beginning of the loop region at the cursor position.<br>Hold the **Shift** button while pressing the **Mark In/Go to In** button to move the cursor to the beginning of the loop region. |
| 5 Mark Out/ Go to Out | Press to set the end of the loop region at the cursor position.<br>Hold the **Shift** button while pressing the **Mark Out/Go to Out** button to move the cursor to the end of the loop region. |
| 6 Event Trim/ Center Cursor | Press to toggle event edge-trimming mode. Press the right or left arrow button to select the next or previous event edge, and then turn the jog dial to trim the event edge.<br>Hold the **Shift** button while pressing the **Event Trim/Center Cursor** button to center the cursor in the timeline view. |
| 7 RTZ/ End | Press to move the cursor to the beginning of the project.<br>Hold the **Shift** button while pressing the **RTZ/End** button to move the cursor to the end of the project. |

### Transport buttons

The Transport buttons allow you to navigate the timeline and preview your project.




| Item | Description |
|---|---|
| 1 Rewind | Press and hold to move backward through the timeline at 20x speed. |
| 2 Fast Forward | Press and hold to move forward through the timeline at 20x speed. |
| 3 Stop | Press to stop playback and return the cursor to its position before playback started.<br>Hold the **Shift** button while pressing the **Stop** button to create a dynamic RAM preview. |
| 4 Play | Press to start playback. Press again to stop playback and leave the cursor at its current position.<br>Hold the **Shift** button while pressing the **Play** button to preview the cursor position. To change the playback duration, use the **Cursor preview duration** control on the Editing tab of the Preferences dialog. |
| 5 Record | Press to start recording. Press again to stop recording and leave the cursor at its current position.<br>Hold the **Shift** button while pressing the **Record** button to render the current selection to a new track. |

### Arrow buttons

The arrow buttons allow you to navigate the timeline and preview your project.

| Item | Description |
|---|---|
| 1 Left/Right | When the **Zoom** button is not selected:<br>• Press the left or right arrow button to move left or right in small increments.<br>• Hold **Ctrl** while pressing the left or right arrow button to move to the previous or next marker.<br>• Hold **Ctrl** + **Shift** while pressing the left or right arrow button to select to the previous or next marker.<br>When the **Zoom** button is selected:<br>• Hold **Shift** while pressing the left or right arrow button to select left or right by pixels.<br>• Hold **Ctrl** while pressing the left or right arrow button to move to the previous or next marker.<br>• Hold **Ctrl** + **Shift** while pressing the left or right arrow button to select to the previous or next marker. |
| 2 Up/Down | When the **Zoom** button is not selected:<br>• Press to zoom in or out.<br>• Hold **Shift** while pressing the up or down arrow button to change the magnification of audio waveforms.<br>• Hold **Ctrl** + **Shift** while pressing the up or down button to change track heights.<br>When the **Zoom** button is selected:<br>• Press to zoom in or out.<br>• Hold **Shift** while pressing the up or down button to change the magnification of audio waveforms.<br>• Hold **Ctrl** while pressing the up or down buttons to zoom to a selection or to the high in/max out.<br>• Hold **Ctrl**+**Shift** while pressing the up or down buttons to change track heights. |

### Jog dial

The jog dial allows you to navigate the timeline when playback is stopped.

#### *Navigating the timeline*

When playback is paused and the **Scrub** button is not selected, the jog dial performs the following functions:

- When the **Zoom** button is not selected, turn the dial clockwise or counterclockwise to navigate the timeline by frames.
- When the **Zoom** button is selected, turn the dial clockwise or counterclockwise to navigate the timeline by pixels.
- Hold the **Shift** button and turn the dial to create a time selection or extend a selection.

#### *Scrubbing the timeline*

During playback, turning the jog dial increases or decreases the playback rate.

When playback is paused and the **Scrub** button is selected, turning the jog dial scrubs the timeline.

#### *Trimming events*

1. Press the **Event Trim** button to enter event trimming mode.
2. Press the left or right arrow button to select the event edge you want to trim. A red bracket is displayed to indicate which event edge will be trimmed.

3. Turn the jog dial to trim the event edge left or right in one-frame increments. Hold **Ctrl** while turning the dial to trim in one-pixel increments. Depending on the current zoom level, the trim duration will vary.

## Using a Frontier TranzPort

Using a Frontier TranzPort, you can control Vegas Pro wirelessly.

*For more information about configuring Vegas Pro to use a control surface, see Using a control surface on page 433.*

### Viewing the control mappings

The map for the TranzPort assigns the controls as follows.

| Control | Function | Shift Function |
|---|---|---|
| Track ◀ | Focus to previous track or mixer control. | Insert audio track. |
| Track ▶ | Focus to next track or mixer control. | |
| Rec | Arm track for record. | |
| Mute | Mute track. | |
| Solo | Solo track. | |
| Undo | Undo. | Redo. |
| In | Set loop start. | |
| Out | Set loop end. | |
| Punch | Toggle metronome. | |
| Loop | Toggle looped playback. | Toggle jog wheel control of volume, panning, input, or output device for tracks or Mixer controls.<br>1. Press Track ◀ or Track ▶ to select the track you want to adjust.<br>2. Press Shift+Loop until the item you want to edit is displayed on the TranzPort.<br>3. Hold Shift while rotating the jog wheel to adjust the selected control. |
| Shift | Toggle alternate functions. | |
| Markers Prev | Move to previous marker. | |
| Markers Add | Insert marker at cursor. | |
| Markers Next | Move to next marker. | |
| Jog Wheel | Scroll cursor. | Adjust volume or pan for current track. |
| ◀◀ | Rewind. | Go to start. |
| ▶▶ | Fast forward. | Go to end. |
| ■ | Stop playback or recording. | |
| ▶ | Play/pause. | |
| ● | Punch in or start recording. | |

### Adjusting track or bus volume

1. Press Track ◀ or Track ▶ to select the track or mixer control you want to adjust.
2. Press Shift+Loop until the TranzPort displays volume.
3. Hold Shift while rotating the jog wheel to adjust the volume of the selected track or mixer control.

### Adjusting track or bus panning

1. Press Track ◄ or Track ► to select the track or mixer control you want to adjust.
2. Press Shift+Loop until the TranzPort displays panning.

> **Note:** *Not all mixer controls allow panning adjustment.*

3. Hold Shift while rotating the jog wheel to adjust panning for the selected track or mixer control.

### Editing a track's input device

1. Press Track ◄ or Track ► to select the track you want to adjust.
2. Press Shift+Loop until the TranzPort displays the track's input device.
3. Hold Shift while rotating the jog wheel to scroll through the available inputs. When you change the input device, an asterisk is displayed before the device name on the TranzPort.
4. Press Shift+Punch to set the input device.

### Editing a track or mixer control's output device

1. Press Track ◄ or Track ► to select the track or mixer control you want to adjust.
2. Press Shift+Loop until the TranzPort displays the track's output device.
3. Hold Shift while rotating the jog wheel to scroll through the available output devices. When you change the output device, an asterisk is displayed before the device name on the TranzPort.
4. Press Shift+Punch to set the output device.

## Using a PreSonus FaderPort

You can use a PreSonus FaderPort to control Vegas Pro software.

*For more information about configuring Vegas Pro software to use a control surface, see Using a control surface on page 433.*

### Viewing the control mappings

The map for the FaderPort assigns the controls as follows.

| Control | Function | Shift Function |
|---|---|---|
| **Fader** | Adjusts volume for the active channel. | |
| **Pan** | Adjusts panning for the active channel. | |
| **Mute** | Mutes the active channel. | |
| **Solo** | Solos the active channel. | |
| **Rec** | Arm the active track for recording. | |
| **Channel** ◄ | Scroll to previous track or mixer control. Scrolls by 8 channels when **Bank** is selected. | |
| **Bank** | Toggles scroll channel/bank mode. | |
| **Channel** ► | Scroll to next track or mixer control. Scrolls by 8 channels when **Bank** is selected. | |
| **Output** | Master Fader mode. | |
| **Read** | Enables channel automation in to Read mode. Press again to turn automation off. | |
| **Write** | Enables channel automation in to Write mode. Press again to turn automation off. | |

| Control | Function | Shift Function |
|---|---|---|
| **Touch** | Enables channel automation in to Touch mode. Press again to turn automation off. | |
| **Off** | Turns the fader off. | |
| **Mix** | Displays the Mixing Console. | Dim mixer output. |
| **Proj** | Switches behavior of fader and rotary knob. | |
| **Trns** | Toggles automation for the active channel. | |
| **Undo** | Reverses the last action performed. | |
| **Shift** | Toggle alternate functions. | |
| **Punch** | Toggles the Metronome on or off. | Moves left to the next marker. |
| **User** | Toggles metronome count-in. | Move right to the next marker. |
| **Loop** | Toggles looped playback. | Add a marker at the cursor position. |
| ◀◀ | Rewind. | Go to start. |
| ▶▶ | Fast forward. | Go to end. |
| ■ | Stop playback or recording. | |
| ▶ | Play/pause. | |
| ● | Punch in or start recording.<br>The LED blinks to indicate tracks are armed for recording and illuminates solidly during recording. | Render selected track to a new track. |
| **Footswitch** | Toggles playback. | Punch in/out recording. |

### Adjusting track or bus volume

1. Press **Channel** (◀) or **Channel** (▶) to select the track or mixer control you want to adjust.
2. Move the fader to adjust the volume of the selected track or mixer control.

> **Tip:** *If you want to use the FaderPort knob to adjust channel volume, select the* **Proj** *button.*

### Adjusting track or bus panning

1. Press **Channel** (◀) or **Channel** (▶) to select the track or mixer control you want to adjust.
2. Turn the FaderPort knob to adjust panning for the selected track or mixer control.

> **Tips:**
>
> - *Not all mixer controls allow panning adjustment.*
> - *If you want to use the FaderPort fader to adjust channel volume, select the* **Proj** *button.*

### Starting recording

1. Arm the tracks you want to arm:
   a. Press **Channel** (◀) or **Channel** (▶) to select the track you want to record into.
   b. Press **Rec** to arm the selected track for recording.
   c. Repeat steps a and b for all tracks you want to arm.
2. Press **Record** (●) to begin recording into all armed tracks.
3. When you're done recording, press **Record** (●) again to stop.

## Using a generic control surface

You can configure up to five generic MIDI control surfaces to work with the Vegas Pro interface.

For information about your specific device, refer to the manufacturer's documentation.

For more information about setting up a control surface, see *Using a control surface on page 433*.

**Notes:**

- *If you have a MIDI controller that includes buttons and knobs or faders, you can use the device as an external control device. For an example of how you can set up a generic control surface to control tracks in your project, see Configuring a generic control surface on page 455.*
- *Effects parameters cannot be adjusted with a generic controller.*
- *A generic control surface can control either trim or automation settings. In order to control automation settings, you must assign a button to place the control surface in automation mode, and the* **Automation Settings** *button () on the track or bus you want to edit must be set to* **Automation Write (Touch)** *or* **Automation Write (Latch)**.

### Customizing your control mappings

Use the **External Control & Automation** tab in the Preferences dialog to select the control surfaces you want to use and adjust their configuration.

1. From the **Options** menu, choose **Preferences** to display the Preferences dialog.
2. Select the **External Control & Automation** tab.
3. Double-click the **Generic Control** entry in the **Active control devices** list to display the Configure Generic Control dialog.
4. To add or change a function do the following:
   a. Choose a setting from the **View function group** drop-down list.
   b. Select the **Learn** check box.
   c. Select an command in the **Host Command** list and activate the control on your control surface.
   d. You can click the **Edit** button to fine-tune the MIDI message settings.
5. Repeat step 4 for each command you want to make available on your control surface.
6. To remove a function, select an item in the **Host Command** list and click the **Reset** button.
7. To remove all functions, click the **Reset All** button.
8. Click the **Save As** button to save your updated configuration file.

### Loading a control mapping file

1. From the **Options** menu, choose **Preferences** to display the Preferences dialog.
2. Select the **External Control & Automation** tab in the Preferences dialog.
3. Double-click the **Generic Control** entry in the **Active control devices** list to display the Configure Generic Control dialog.
4. Click the **Open** button and browse to the mapping file you want to use.
5. Click **OK** to apply your changes and return to the Preferences dialog.
6. Click **OK** to close the Preferences dialog.

## Configuring a generic control surface

If you have a MIDI controller that includes buttons and knobs or faders, you can use the device as an external control surface.

For example, let's assume that you have a MIDI keyboard that has 8 knobs. This section will show you how you can use those knobs to control the volume on the tracks in your project.

**Notes:**

- *You can use this same process to assign a controller to any configurable parameter. To adjust track volume, we're selecting* **Channel x Fader** *in the* **Host Command** *list in step 9 below. However, if you wanted to adjust panning, you could choose* **Channel x Pan***, or if you wanted to adjust the bus send level, you could choose* **Channel x Send***.*
- *Effect parameters cannot be controlled with a generic controller.*
- *A generic control surface can control either trim or automation settings. In order to control automation settings, you must assign a button to place the control surface in automation mode, and the* **Automation Settings** *button () on the track or bus you want to edit must be set to* **Automation Write (Touch)** *or* **Automation Write (Latch)**.

1. From the **Options** menu, choose **Preferences** to display the Preferences dialog.
2. Select the **MIDI** tab, and verify that the port where your controller is connected is selected in the **Make these devices available for MIDI input** list.
3. Select the **External Control & Automation** tab.
4. From the **Available devices** drop-down list, choose **Generic Control**, and then click the **Add** button. The Generic Control is added to the **Active control devices** list.
5. Double-click the **Generic Control** entry in the **Active control devices** list to display the Configure Generic Control dialog.
6. Because the MIDI keyboard in our example has 8 knobs, type 8 in the **Number of channels** box.
7. Now, let's assign buttons to shift the channel banks up and down so you can control all the tracks in your project.

   For example, when you start using the controller, the knobs will adjust tracks 1-8. When you shift the banks down, you can control tracks 9-16, and so on.

   a. From the **View function group** drop-down list, choose **Channels**.
   b. Select the **Learn** check box.
   c. Select **Channel Bank Down** from the **Host Command** list.
   d. Press the button or key you want to use to switch to the next group of 8 tracks.
   e. Select **Channel Bank Up** from the **Host Command** list.
   f. Press the button or key you want to use to switch to the previous group of 8 tracks.
8. Choose **Audio Channels** from the **View function group** drop-down list.
9. Program each knob:
   a. Verify that the **Learn** check box is still selected.
   b. Select **Channel 1 Fader** from the **Host Command** list.
   c. Turn knob 1 on your MIDI keyboard. You'll notice that the **Channel**, **MIDI Message**, and **MIDI Data** columns are updated.
   d. Repeat steps 9a and 9b to program knobs 2 through 8 on your keyboard.
10. Now, let's assign a button to toggle the controller in and out of automation mode so we can use the knobs to adjust the track's volume (trim) or record volume automation:
    a. From the **View function group** drop-down list, choose **Assign**.
    b. Select **Toggle Automation Mode** from the **Host Command** list.
    c. Verify that the **Learn** check box is still selected, and then press the button or key you want to use to switch your control surface in and out of automation mode.

    You'll notice that the **Channel**, **MIDI Message**, and **MIDI Data** columns are updated.
11. Click **OK** to close the Configure Generic Control dialog, and then click **OK** to close the Preferences dialog.

12. From the **Options** menu, choose **External Control** to enable your controller.

You're ready to start using your controller.

- Turn each knob on your controller and notice that turning knob 1 adjusts the volume (trim) of track 1, turning knob 2 adjusts the volume of track 2, and so on.
- Press the button that you assigned to scroll the channel bank down in step 7.

  Turn each knob on your controller and notice that turning knob 1 now adjusts the volume (trim) of track 9, turning knob 2 adjusts the volume of track 10, and so on.
- Press the button that you assigned to scroll the channel bank up in step 7 so you can control tracks 1-8 again.
- Press the button that you assigned to toggle automation mode in step 10.

  Select the **Automation Settings** button ( ) on each track to enable automation recording.

  Start playback, and turn each knob on your controller, and notice that turning knob 1 records volume automation on track 1, turning knob 2 records automation on track 2, and so on.
- Press the automation mode toggle button once more, and you can use the knobs to adjust track trim levels again.

## Using a joystick

You can use a joystick to adjust faders, surround panning, and the color wheel controls in the color corrector plug-ins.

If you're using a force-feedback joystick, force feedback adds a tactile element to your editing sessions.

The Joystick Profiles folder in the Vegas Pro program folder contains .ini files to provide button mapping for several joysticks and instructions for creating or editing joystick mappings. These profiles are specific to each model of joystick. If only trigger functions are working for your joystick, a default profile is being used. Please check our download page for updated profiles: *http://www.sonycreativesoftware.com/download/default.asp*

Follow your manufacturer's instructions for calibrating your joystick before using it with Vegas Pro software.

### Using the Microsoft SideWinder Force Feedback 2 joystick

| Control | Function |
|---|---|
| Trigger | Enable joystick. |
| Stick | Move the control that has focus. |
| Hat (POV) switch | Move pan point to edges or corners of surround panner or Surround Panner window. |
| Button 2 | Reset control to default for faders that take focus or Color Corrector color wheels. Centers track panning for stereo projects.<br>Open/close Surround Panner window. |
| Button 3 | Move to previous panning keyframe, Mixer control, or Color Corrector color wheel. |
| Button 4 | Move to next panning keyframe, Mixer control, or Color Corrector color wheel. |
| Button 5 | Hold button and adjust throttle control to adjust **Volume** fader in track list.<br>Hold button and adjust throttle control to adjust bus **Volume** or assignable effect **Output** fader in Mixer.<br>Hold button and adjust throttle control to adjust **Center** fader in Surround Panner window. |
| Button 6 | Hold button and adjust throttle control to adjust multipurpose fader in track list.<br>Hold button and adjust throttle control to adjust assignable effect input fader in Mixer.<br>Hold button and adjust throttle control to adjust **Smoothness** slider in Surround Panner window. |
| Button 7 | Move focus to previous track, Mixer control, or color wheel. |
| Button 8 | Move focus to next track, Mixer control, or color wheel. |
| Throttle control | Combine with buttons 5 or 6 to adjust the selected control. |

### Using the Logitech Wingman joystick

| Control | Function |
|---|---|
| Trigger | Enable joystick. |
| Stick | Move the control that has focus. |
| Hat (POV) switch | Move pan point to edges or corners of surround panner or Surround Panner window. |
| Button 2 | Move focus to previous track, Mixer control, or Color Corrector color wheel. |
| Button 3 | Move focus to next track, Mixer control, or Color Corrector color wheel. |
| Button 4 | Move to next panning keyframe or Mixer control, or Color Corrector color wheel. |
| Button 5 | Move to previous panning keyframe or Mixer control, or Color Corrector color wheel. |
| Button 6 | Reset control to default for faders that take focus or Color Corrector color wheels. Centers track panning for stereo projects.<br>Open/close Surround Panner window. |
| Button 7 | Hold button and adjust throttle control to adjust **Volume** fader in track list.<br>Hold button and adjust throttle control to adjust bus **Volume** or assignable effect **Output** fader in Mixer.<br>Hold button and adjust throttle control to adjust **Center** fader in Surround Panner window. |
| Throttle control | Combine with button 7 to adjust the selected control. |

### Using the Gravis Eliminator Precision Pro joystick

| Control | Function |
|---|---|
| Trigger | Enable joystick. |
| Stick | Move the control that has focus. |
| Hat (POV) switch | Move pan point to edges or corners of surround panner or Surround Panner window. |
| Button 2 | Change pan curve in Surround Panner window. |
| Button 3 | Move focus to previous track, Mixer control, or Color Corrector color wheel. |
| Button 4 | Move focus to next track, Mixer control, or Color Corrector color wheel. |
| Button 5 | Reset control to default for faders that take focus or Color Corrector color wheels. Centers track panning for stereo projects.<br>Open/close Surround Panner window. |
| Scroll wheel | Move to previous/next panning keyframe or Mixer control, or Color Corrector color wheel. |
| Button 6<br>(Press scroll wheel) | Open/close Surround Panner window. |
| Button 7 | Hold button and adjust throttle control to adjust **Volume** fader in track list.<br>Hold button and adjust throttle control to adjust bus **Volume** or assignable effect **Output** fader in Mixer.<br>Hold button and adjust throttle control to adjust Center fader in Surround Panner window. |
| Button 8 | Hold button and adjust throttle control to adjust multipurpose fader in track list.<br>Hold button and adjust throttle control to adjust assignable effect Input fader in Mixer.<br>Hold button and adjust throttle control to adjust Smoothness slider in Surround Panner window. |
| Throttle control | Combine with button 7 or 8 to adjust the selected control. |

## Using a Multimedia Controller

Vegas Pro software supports several multimedia controllers that you can use for mouse-free editing and playback. Now you can increase your productivity and still have a free hand for your coffee mug.

This topic is intended to show you how the Vegas Pro interface interacts with several multimedia controllers that we're familiar with and have tested. Other controllers may also work.

For specific information about your multimedia controller, please refer to the manufacturer's documentation.

### Contour ShuttlePro default settings

#### Default setup

ShuttlePro .pref files are included with your Vegas Pro installation. You can use these files to configure the Contour ShuttlePro or ShuttlePro v2 for use with Vegas Pro software. After you use the ShuttlePro Control Panel to import the appropriate .pref file from the Vegas Pro application folder, the controls will behave as follows:

**Tip:** *If you have version 2.5 or later of the Shuttle Pro driver, you can use the driver's Export Settings Info feature to create a graphical representation of your current settings.*

| | | | | | | |
|---|---|---|---|---|---|---|
| **Top Button Row** | | | | | | |
| | | Previous Marker<br>Ctrl+Left Arrow | Previous Grid Division<br>Page Up | Next Grid Division<br>Page Down | Next Marker<br>Ctrl+Right Arrow | |
| **Second Button Row** | | | | | | |
| | Deselect All<br>Ctrl+Shift+A | Select Event Start<br>[ | Exit Event Edit<br>Numeric Keypad 5 | | Select Event End<br>] | Preview Cursor<br>Numeric Keypad 0 |
| **Shuttle Ring** | | | | | | |
| | Mark In<br>(ShuttlePro v2 only) | | Turn left or right for variable-speed playback | | | Mark Out<br>(ShuttlePro v2 only) |
| **Jog Dial** | | | Jog/Edit Left<br>F3 | Jog/Edit Right<br>F9 | | |
| **Bottom Button Row** | | Play/Pause<br>Enter | | | Zoom In<br>Up Arrow | |
| | | Play/Stop<br>Spacebar | | | Zoom Out<br>Down Arrow | |

### Contour ShuttleXpress default settings

ShuttleXpress .pref files are included with your Vegas Pro installation. You can use these files to configure the Contour ShuttleXpress for use with Vegas Pro software. After you use the ShuttleXpress Control Panel to import the appropriate .pref file from the Vegas Pro application folder, the controls will behave as follows:

> **Tip:** *If you have version 2.5 or later of the ShuttleXpress driver, you can use the driver's Export Settings Info feature to create a graphical representation of your current settings.*

| **Buttons** | Play/Pause<br>Enter | Select Event Start<br>[ | Exit Event Edit<br>Numeric Keypad 5 | Select Event End<br>] | Preview Cursor<br>Numeric Keypad 0 |
|---|---|---|---|---|---|
| **Shuttle Ring** | | | | | |
| | | | Turn left or right for variable-speed playback | | |
| **Jog Dial** | | | Jog/Edit Left<br>F3 | Jog/Edit Right<br>F9 | |

### Navigating the timeline with a ShuttlePro or ShuttleXpress

Use shuttle ring and jog dial to navigate the timeline. If you're using a ShuttlePro, you can also use the buttons in the top and bottom rows to navigate.

You can set the speed of the shuttle ring using the **JKL / shuttle speed** drop-down list on the Editing tab of the Preferences dialog. *For more information, see Editing tab on page 427.*

### Navigating the timeline with a PowerMate or other controller

If you have a multimedia controller such as the Griffin Technology PowerMate, you can map your controller to the F3/F9 jog/edit keys.

Map the single-button function to the Enter key for Play/Pause functionality. When paused, the knob will jog by frame.

When you use the [ or ] keys to enter event edge-trimming mode, the knob will trim the event:

- Turn the knob left or right to trim the selected event edge:
- Hold Alt while turning the knob to perform a slip trim.
- Hold Ctrl while turning the knob to change the event's playback rate.
- Hold Ctrl+Alt while turning the knob to perform an adjacent trim.

During playback, the knob will function as a variable-speed shuttle control. You can set the speed of the shuttle control using the **JKL / shuttle speed** drop-down list on the Editing tab of the Preferences dialog. *For more information, see Editing tab on page 427.*

### Editing events with a ShuttlePro or ShuttleXpress

You can use the second row of buttons and the jog dial to make the keyboard-based event edge-trimming method even better.

1. If you want downstream events to ripple as you trim, click the **Auto Ripple** button ( ) to turn on Auto Ripple mode.
2. Press the **Deselect All** button on the ShuttlePro to deselect all events.
3. Select a track and position the edit cursor over the event you want to edit.
4. Press the **Select Event Start** or **Select Event End** buttons and move to the edge you'd like to edit. A red bracket is displayed in the timeline to indicate which event edge will be trimmed.
5. Edit to your heart's content:
   - Turn the jog dial left or right to trim the selected event edge.
   - Hold Alt while turning the jog dial to perform a slip trim.
   - Hold Ctrl while turning the jog dial to change the event's playback rate.
   - Hold Ctrl+Alt while turning the jog dial to perform an adjacent trim.

# Appendix B

# Glossary

**A-Law**

A companded compression algorithm for voice signals defined by the Geneva Recommendations (G.711). The G.711 recommendation defines A-Law as a method of encoding 16-bit PCM signals into a nonlinear 8-bit format. The algorithm is commonly used in United States telecommunications. A-Law is very similar to μ-Law, however, each uses a slightly different coder and decoder.

**Adaptive Delta Pulse Code Modulation (ADPCM)**

A method of compressing audio data. Although the theory for compression using ADPCM is standard, there are many different algorithms employed. For example, the ADPCM algorithm from Microsoft® is not compatible with the International Multimedia Association's (IMA) approved ADPCM.

**Aliasing**

A type of distortion that occurs when digitally recording high frequencies with a low sample rate. For example, in a motion picture, when a car's wheels appear to slowly spin backward while the car is quickly moving forward, you are seeing the effects of aliasing. Similarly, when you try to record a frequency greater than one-half of the sampling rate (the Nyquist Frequency), instead of hearing a high pitch, you may hear a low-frequency rumble.

To prevent aliasing, an anti-aliasing filter is used to remove high-frequencies before recording. Once the sound has been recorded, aliasing distortion is impossible to remove without also removing other frequencies from the sound. This same anti-aliasing filter must be applied when resampling to a lower sample rate.

**Alpha Channel**

Alpha is a fourth channel that determines how transparency is handled in an image file. The RGB channels are blended to determine each pixel's color, and the corresponding alpha channel determines each pixel's transparency. The alpha channel can have up to 256 shades of gray: 0 represents a transparent pixel, 255 represents an opaque pixel, and intermediate values are semitransparent.

**Amplitude Modulation (AM)**

A process whereby the amplitude (loudness) of a sound is varied over time. When varied slowly, a tremolo effect occurs. If the frequency of modulation is high, many side frequencies are created which can strongly alter the timbre of a sound.

**Analog**

When discussing audio, this term refers to a method of reproducing a sound wave with voltage fluctuations that are analogous to the pressure fluctuations of the sound wave. This is different from digital recording in that these fluctuations are infinitely varying rather than discrete changes at sample time. (*See Quantization (Audio) on page 469.*)

**Aspect Ratio**

Describes the frame size of your video as a ratio of its width to its height. For example, video shot in NTSC DV format has a frame size of 720 by 480 pixels, which is roughly a 1.33:1 aspect ratio:

720 (frame width) ÷ 480 (frame height) = 1.5

1.5 x 0.9091 (pixel aspect ratio) = 1.36365.

| Frame Size | Example |
|---|---|
| 4:3 Standard Television<br>1.33:1 Aspect Ratio | |
| 16x9 Widescreen Television<br>1.78:1 Aspect Ratio | |
| Academy Flat Theatrical Frame<br>1.85:1 Aspect Ratio | |
| Academy Scope Theatrical Frame<br>2.35:1 Aspect Ratio | |

**ASIO**

ASIO (Audio Stream In/Out)™ is a low-latency driver model developed by Steinberg Media Technologies AG.

**Attack**

The attack of a sound is the initial portion of the sound. Percussive sounds (drums, piano, guitar plucks) are said to have a fast attack. This means that the sound reaches its maximum amplitude in a very short time. Sounds that slowly swell up in volume (soft strings and wind sounds) are said to have a slow attack.

**Attenuation**

A decrease in the level of an audio signal.

**Audio Compression Manager (ACM)**

The Audio Compression Manager from Microsoft® is a standard interface for audio compression and signal processing for Windows®. The ACM can be used by software programs to compress and decompress .wav files.

**AVI**

A file format of digital video. Vegas Pro software allows you to open, edit and create new .avi files.

**Bandwidth**

When discussing audio equalization, each frequency band has a width associated with it that determines the range of frequencies that are affected by the EQ. An EQ band with a wide bandwidth will affect a wider range of frequencies than one with a narrow bandwidth.

Bandwidth can also refer to the amount of data that can be transferred via a connection, such as a network or modem. For example, streaming media must be compressed due to the limited bandwidth of most Internet connections.

**Beats per Measure**

The time signature of a piece of music contains two pieces of information: the number of beats in each measure of music, and which note value gets one beat. This notion is used to determine the number of ticks to put on the ruler above the timeline, and to determine the spacing when the ruler displays in Measures & Beats format.

**Beats per Minute (BPM)**

In music theory, the tempo of a piece of music can be written as a number of beats in one minute. If the tempo is 60 BPM, a single beat occurs once every second. Lower BPM's equal slower tempo, and vice versa.

**Bit**

A bit is the most elementary unit in digital systems. Its value can only be 1 or 0, corresponding to a voltage in an electronic circuit. Bits are used to represent values in the binary numbering system. As an example, the 8-bit binary number 10011010 represents the unsigned value of 154 in the decimal system. In digital sampling, a binary number is used to store individual sound levels, called samples.

**Bit Depth**

The number of bits used to represent a single sample. Vegas Pro software uses either 8, 16, or 24-bit samples. Higher values increase the quality of the playback and any recordings that you make. While 8-bit samples take up less memory (and hard disk space), they are inherently noisier than 16 or 24-bit samples.

**Brightness**

Adjusting brightness adds or subtracts values from the color channels in an image to make the image lighter or darker. The maximum brightness setting adds 255 (pure white), and the minimum setting adds 0 (pure black).

**Bus**

A virtual pathway where signals from tracks and effects are mixed. The configuration of busses is saved with the project whereas the routing of busses to hardware is saved with the system. In this way, projects can be easily moved from one system to another without modifying the original layout of the project.

**Byte**

Refers to a set of 8 bits. An 8-bit sample requires one byte of memory to store, while a 16-bit sample takes two bytes of memory to store.

**CCD**

Charge coupled device. The image sensor in a digital camera.

**Chroma**

The values that convey chrominance information.

**Chrominance**

The color content of an image without respect to its brightness.

### Clipboard

The Clipboard is where data that you have cut or copied in Vegas Pro software is stored. You can then paste the data back into Vegas Pro software at a different location, or paste it into other applications.

### Clipping

Clipping is what occurs when the amplitude of a sound is above the maximum allowed recording level. In digital systems, clipping is seen as a clamping of the data to a maximum value, such as 32,767 in 16-bit data. Clipping causes sound to distort.

### Codec

An acronym for COmpressor/DECompressor. A codec is an computer algorithm that is used to compress video and audio data, shrinking file sizes and data rates.

### Crossfade

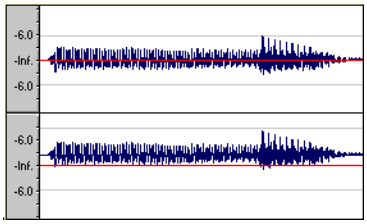
Mixing two pieces of media by fading one out as the other fades in.

### Cutoff frequency

The cutoff frequency of a filter is the frequency at which the filter changes its response. For example, in a low-pass filter, frequencies greater than the cutoff frequency are attenuated while frequencies less than the cutoff frequency are not affected.

### DC Offset

DC Offset occurs when hardware, such as a sound card, adds DC current to a recorded audio signal. This current causes the audio signal to alternate around a point above or below the normal -infinity dB (center) line in the sound file. To see if you have a DC offset present, you can zoom all the way into a sound file and see if it appears to be floating over the center line. In the following example, the red line represents 0 dB. The lower waveform exhibits DC offset; note that the waveform is centered approximately 2 dB above the baseline.




### Decibel (dB)

A unit used to represent a ratio between two numbers using a logarithmic scale. For example, when comparing the numbers 14 and 7, you could say 14 is two times greater than the number 7; or you could say 14 is 6 dB greater than the number 7. Where did we pull that 6 dB from? Engineers use the equation dB = 20 x log (V1/V2) when comparing two instantaneous values. Decibels are commonly used when dealing with sound because the ear perceives loudness in a logarithmic scale.

In Vegas Pro software, most measurements are given in decibels. For example, if you want to double the amplitude of a sound, you apply a 6 dB gain. A sample value of 32,767 (maximum positive sample value for 16-bit sound) can be referred to as having a value of 0 dB. Likewise, a sample value of 16,384 can be referred to having a value of -6 dB.

### Device Driver

A program that enables Microsoft Windows to connect different hardware and software. For example, a sound card device driver is used by software to control sound card recording and playback.

### Digital Signal Processing (DSP)

A general term describing anything that alters digital data. Signal processors have existed for a very long time (tone controls, distortion boxes, wah-wah pedals) in the analog (electrical) domain. Digital Signal Processors alter the data after it has been digitized by using a combination of programming and mathematical techniques. DSP techniques are used to perform many effects such as equalization and reverb simulation.

Since most DSP is performed with simple arithmetic operations (additions and multiplications), both your computer's processor and specialized DSP chips can be used to perform any DSP operation. The difference is that DSP chips are optimized specifically for mathematical functions while your computer's microprocessor is not. This results in a difference in processing speed.

### Dithering

The practice of adding noise to a signal to mask quantization noise. *See also Noise-shaping on page 467*.

### Dynamic Range

The difference between the maximum and minimum signal levels. It can refer to a musical performance (high volume vs. low volume signals) or to electrical equipment (peak level before distortion vs. noise floor). For example, orchestral music has a wide dynamic range, while thrash metal has a very small (always loud) range.

### Emphasis

A rudimentary noise reduction process that involves a boost in the high frequencies during the recording of the CD and a complimentary cut in the same frequencies during the playback of the CD. The result reduces high frequency noise without disrupting the natural frequency response of the source material. If the emphasis flag is set for a track, any CD player that has a de-emphasis circuit will impart the high frequency cut on the track. Be aware that Vegas Pro software cannot impart the pre-emphasis boost on a track; it can only set the emphasis flag.

### Endian (Little and Big)

Little and Big Endian describe the ordering of multi-byte data that is used by a computer's microprocessor. Little Endian specifies that data is stored in a low to high-byte format; this ordering is used by the Intel® microprocessors. Big Endian specifies that data is stored in a high to low-byte format; this ordering is used by the Motorola® microprocessors.

### Envelopes (Audio and Video)

Envelopes, as used by Vegas Pro software, are a way of automating the change of a certain parameter over time. In the case of volume, you can create a fade out (which requires a change over time) by adding an envelope and creating an extra point to the line that indicates where the fade starts. Next, you pull the end point of the envelope down to -inf. *For more information, see Working with track envelopes on page 171*.

### Equalization (EQ)

The process by which certain frequency bands are raised or lowered in level. EQ has various uses. The most common use in Vegas Pro software is to simply adjust the subjective timbrel qualities of a sound.

### Event

Media files that have been dragged onto the timeline in Vegas Pro software are referred to as events. An event is actually a window into a media file and is a reference, or pointer, to the file. It can display all or part of a media file and can be edited without altering the source media (nondestructive).

### Field Order

Video that is displayed on a television is interlaced. This means that every frame of video is actually composed of two fields, each of which is made up of half of the lines that make the final frame. These two fields are woven together in alternate lines, but which of the two fields is displayed first (the field order) can be important. You can set the field order for video in the Project Properties dialog or, when rendering a project, in the Custom Template dialog.

**File Format**

A file format specifies the way in which data is stored on your floppy disks or hard drive. In Windows for example, the most common audio file format is the Microsoft WAV format. However, Vegas Pro software can read and write to many other file formats so you can maintain compatibility with other software and hardware configurations.

**Frame Rate (Audio)**

Audio uses frame rates only for the purposes of synching to video or other audio.

**Frame Rate (Video)**

The speed at which individual images in the video are displayed on the screen. A faster frame rate results in smoother motion in the video. However, more times than not, frame rate is associated with SMPTE standard frame rates for video: 29.97 for NTSC (used in US, North and Central America, parts of South America, and Japan), 25 for PAL (used in many parts of the world, including Europe and much of Asia), or 24 for film.

**Frequency Spectrum**

The frequency spectrum of a signal refers to its range of frequencies. In audio, the frequency range is basically 20 Hz to 20,000 Hz. The frequency spectrum sometimes refers to the distribution of these frequencies. For example, bass-heavy sounds have a large frequency content in the low end (20 Hz - 200 Hz) of the spectrum.

**Hertz (Hz)**

The unit of measurement for frequency or cycles per second (CPS).

**Insertion Point**

The insertion point (also referred to as the cursor position) is analogous to the cursor in a word processor. It is where pasted data is placed or other data is inserted, depending on the operation. The insertion point appears as a vertical flashing black line and can be moved by clicking the left mouse button anywhere in the timeline.

**Inverse telecine**

Telecine is the process of converting 24 fps (cinema) source to 30 fps video (television) by adding pulldown fields. Inverse telecine, then, is the process of converting 30 fps (television) video to 24 fps (cinema) by removing pulldown.

**Markers**

Saved locations in the sound file. Markers can be displayed in the Trimmer window for sound files that contain them, but more often, markers and regions are used at the project level to mark locations or sections in the project.

**Media Control Interface (MCI)**

A standard way for Microsoft Windows programs t o communicate with multimedia devices like sound cards and CD players. If a device has a MCI device driver, it can easily be controlled by most multimedia Microsoft Windows software.

**Media File**

A media file, or multimedia file, is any image, audio or video file on a computer. In Vegas Pro software, you can browse for these files in the Explorer window. You can drag media files to the timeline or insert them into the Project Media window. Media files that have been dragged to the timeline are referred to as events.

**MIDI Clock**

A MIDI device specific timing reference. It is not absolute time like MIDI timecode (MTC); instead, it is a tempo-dependent number of ticks per quarter note. MIDI clock is convenient for synchronizing devices that need to do tempo changes mid-song.

**MIDI Port**

A MIDI Port is the physical MIDI connection on a piece of MIDI gear. This port can be a MIDI in, out or through. Your computer must have a MIDI port to output MIDI timecode to an external device or to receive MIDI timecode from an external device.

**MIDI Timecode (MTC)**

MTC is an addendum to the MIDI 1.0 Specification and provides a way to specify absolute time for synchronizing MIDI-capable applications. Basically, it is a MIDI representation of SMPTE timecode.

**Mix**

The process of combining multiple audio events and effects into a final output. The analogous process of combining video events together is called compositing.

**Musical Instrument Digital Interface (MIDI)**

A standard language of control messages that provides for communication between any MIDI compliant devices. Anything from synthesizers to lights to stage equipment can be controlled via MIDI. Vegas Pro software utilizes MIDI for synchronization purposes.

**Noise-shaping**

Noise-shaping is a technique that can minimize the audibility of quantization noise by shifting its frequency spectrum. For example, in 44,100 Hz audio, quantization noise is shifted towards the Nyquist Frequency of 22,050 Hz. *See also Dithering on page 465*.

**Nondestructive Editing**

A type of editing used by Vegas Pro software that involves a pointer-based system of keeping track of edits. When you delete a section of audio in a nondestructive system, the audio on disk is not actually deleted. Instead, a set of pointers is established to tell the program to play the active sections during playback.

**Nonlinear Editing (NLE)**

A method of editing video non-sequentially or in random order. Editing video in Vegas Pro software is nonlinear as opposed to editing video tape, which is linear.

**Normalize**

Refers to raising the volume so that the highest level sample in the file reaches a user-defined level. Use this function to make sure you are fully utilizing the dynamic range available to you.

**Nyquist Frequency**

The Nyquist Frequency (or Nyquist Rate) is one-half of the sample rate and represents the highest frequency that can be recorded using the sample rate without aliasing. For example, the Nyquist Frequency of 44,100 Hz is 22,050 Hz. Any frequencies higher than 22,050 Hz produce aliasing distortion in the sample if an anti-aliasing filter is not used while recording.

**OPT Plug-In**

A plug-in that uses Open Plug-in Technology (OPT) standard from Yamaha™. OPT plug-ins provide tools for working with MIDI such as edit views, effect processors and filters, arpeggiators, and real-time panel automation.

**Pan**

To place a mono or stereo sound source perceptually between two or more speakers.

**Peak File (.sfk)**

Vegas Pro software displays the waveform of audio files graphically on a computer monitor. This visual information must be generated by Vegas Pro software when the audio file is opened and can take a few seconds. Vegas Pro software then saves this information as a peak file (.sfk). This file stores the information for displaying waveform information so that opening a file is almost instantaneous. The peak file is stored in the directory in which the file resides and has an .sfk extension. If the peak file is not in the same directory as the file, or is deleted, Vegas Pro software regenerates it the next time you open the file.

**Pixel Aspect Ratio**

Computers display pixels as squares: 1.0. Televisions display individual pixels as rectangles: 0.9091 (NTSC DV, D1), 1.0926 (PAL DV, D1), or other rectangular variations. Using the wrong pixel aspect ratio can result in distortions or stretching of the video. You can set the pixel aspect ratio in the Project Properties dialog or, when rendering, in the Custom Template dialog. You should choose the aspect ratio based on the final movie's destination. Consult your hardware manual if you are in doubt about the appropriate ratio. The pixel aspect ratio is unrelated to the frame's aspect ratio.

**Plug-In**

An effect that can be added to the product to enhance the feature set. Vegas Pro software supports DirectX compatible plug-ins. The built-in EQ, Compression and Dithering effects are also considered plug-ins because they work in other DirectX-compatible applications.

**Plug-In Chain**

Plug-ins can be strung together into a chain so that the output of one effect feeds into the input of another. This allows for complex effects that couldn't otherwise be created.

**Pre-roll/Post-roll**

Pre-roll is the amount of time elapsed before an event occurs. Post-roll is the amount of time after the event. The time selection defines the pre- and post-roll when recording into a selected event.

**Preset**

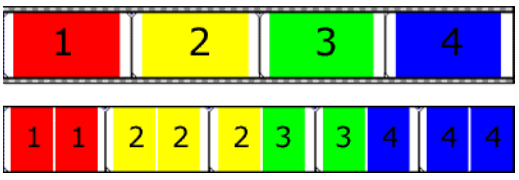
A snapshot of the current settings in a plug-in. Presets are created and named so that you can easily get back to a sound or look that you have previously created.

A preset calls up a bulk setting of a function in Vegas Pro software. If you like the way you tweaked that EQ, but do not want to have to spend the time getting it back for later use, save it as a preset. Presets appear in the top of plug-in windows in Vegas Pro software.

**Pulldown**

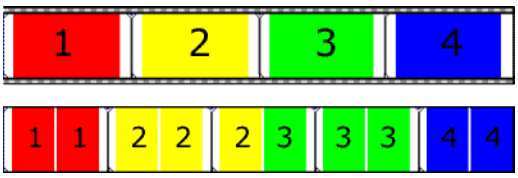
In telecine conversion, fields are added to convert 24 fps film to 30 fps video.

In 2-3 pulldown, for example, the first frame is scanned into two fields, the second frame is scanned into three fields, and so on for the duration of the film. 2-3 pulldown is the standard for NTSC broadcasts of 24p material. Use 2-3 pulldown when printing to tape, but not when you intend to use the rendered video in Vegas Pro software. Removing 2-3 pulldown is inefficient because the pulldown fields that are created for frame 3 span two frames:




24 fps film (top) and resulting NTSC video with 2-3 pulldown fields (bottom)

Use 2-3-3-2 pulldown when you plan to use your rendered video in Vegas Pro software as source media. When removing 2-3-3-2 pulldown, Vegas Pro software simply discards frame three and merges the pulldown fields in the remaining frames:




24 fps film (top) and resulting NTSC video with 2-3-2-2 pulldown fields (bottom)

**Pulse Code Modulation (PCM)**

PCM is the most common direct binary representation of a level of an uncompressed audio signal. This method of coding yields the highest fidelity possible when using digital storage.

**Punch-In**

Punching-in during recording means automatically starting and stopping recording at user-specified times. In Vegas Pro software, shorter events can be punched into longer ones.

**Quadraphonic**

A mixing implementation that allows for four discrete audio channels. These are usually routed to two front speakers and two back speakers to create immersive audio mixes.

**Quantization (Audio)**

The process by which measurements are rounded to discrete values. Specifically with respect to audio, quantization is a function of the analog-to-digital conversion process. The continuous variation of the voltages of a analog audio signal are quantized to discrete amplitude values represented by digital, binary numbers. The number of bits available to describe these values determines the resolution or accuracy of quantization. For example, if you have 8-bit analog-to-digital converters, the varying analog voltage must be quantized to 1 of 256 discrete values; a 16-bit converter has 65,536 values. Quantization is to level as sampling rate is to time.

**Quantization Noise**

A result of describing an analog signal in discrete digital terms (*See Quantization (Audio) on page 469.*) This noise is most easily heard in low resolution digital sounds that have low bit depths and is similar to a hiss while the audio is playing. It becomes more apparent when the signal is at low levels, such as when doing a fade out. *See also Dithering on page 465*.

**Quantizing (MIDI)**

The correction of rhythms to align with selected note lengths or beats in a MIDI sequence.

**Quantizing (Video)**

Limiting all editing to frame boundaries. *For more information, see Quantizing to frames on page 102*.

**Red Book specification**

The Red Book defines the specifications of every audio compact disc in every music store throughout the world. Red Book specifications define not only the information within the disc (digital audio recorded at 44.1 kHz), but also the disc size itself and the way in which the audio is arranged.

**Region**

A subsection of a sound file denoted by a start and end point. You can define any number of regions in a sound file.

### Rendering

The process by which Vegas Pro software saves the project to a specific file format like AVI or WMA.

### Resample

The act of recalculating samples in a sound file at a different rate than the file was originally recorded. If an audio file is resampled at a lower rate, Vegas Pro software decreases sample points. As a result, the file size and the frequency range are reduced. When resampling to a higher sample rate, Vegas Pro software interpolates extra sample points in the sound file. This increases the size of the sound file but does not increase the quality. When down-sampling, one must be aware of aliasing (see Aliasing). Vegas Pro software automatically resamples all audio to the project's sample rate.

### Ripple; Ripple Editing

A type of editing where events are moved out of the way to make room for newly inserted events as opposed to simply being overwritten. When a one minute event is ripple inserted into a project, the duration of a project lengthens by one minute. If ripple editing is turned off, the same operation would not affect the overall duration of the project.

### Roll

Originally, a conventional studio typically had two source decks that were used to play back video to a final destination or output deck. These two source decks were commonly referred to as the A and B rolls. In Vegas Pro software, a video track can be configured to display an A and a B roll, which appear as sub-tracks. The concept is extended further in Vegas Pro software to include a transition roll between the A and B rolls. *For more information, see Understanding track layers on page 326.*

### Ruler

The ruler is the area above the tracks that shows the horizontal axis units.

### Sample

The word sample is used in many different (and often confusing) ways when talking about digital sound. Here are some of the different meanings:

- A discrete point in time which a sound signal is divided into when digitizing. For example, an audio CD-ROM contains 44,100 samples per second. Each sample is really only a number that contains the amplitude value of a waveform measured over time.
- A sound that has been recorded in a digital format; used by musicians who make short recordings of musical instruments to be used for composition and performance of music or sound effects. These recordings are called samples. In this manual, we try to use sound file instead of sample whenever referring to a digital recording.
- The act of recording sound digitally (that is, to sample an instrument) means to digitize and store it.

### Sample Rate

The sample rate (also referred to as the sampling rate or sampling frequency) is the number of samples per second used to store a sound. High sample rates, such as 44,100 Hz provide higher fidelity than lower sample rates, such as 11,025 Hz. However, more storage space is required when using higher sample rates. Sampling rate is to time as quantization is to level.

### Sample Size

*See Bit Depth on page 463.*

### Sample Value

The sample value (also referred to as sample amplitude) is the number stored by a single sample. In 16-bit audio, these values range from -32768 to 32767. In 8-bit audio, they range from -128 to 127. The maximum allowed sample value is often referred to as 100% or 0 dB.

**.sfap0**

Sony Creative Software Inc. audio proxy file.

**.sfk**

*See Peak File (.sfk) on page 468.*

**Shortcut Menu**

A context-sensitive menu that appears when you right-click certain areas of the screen. The functions available in the shortcut menu depend on the object being clicked on as well as the state of the program. As with any menu, you can select an item from the shortcut menu to perform an operation. Shortcut menus are used frequently in Vegas Pro software for quick access to many commands. An example of a shortcut menu can be found by right-clicking any event along the timeline.

**Signal-to-Noise Ratio**

The signal-to-noise ratio (SNR) is a measurement of the difference between a recorded signal and noise levels. A high SNR is always the goal.

The maximum signal-to-noise ratio of digital audio is determined by the number of bits per sample. In 16-bit audio, the signal to noise ratio is 96 dB, while in 8-bit audio, the ratio is 48 dB. However, in practice, this SNR is never achieved, especially when using low-end electronics.

**Small Computer Systems Interface (SCSI)**

A standard interface protocol for connecting devices to your computer. The SCSI bus can accept up to seven devices at a time including CD-ROM drives, hard drives and samplers.

**SMPTE**

SMPTE is the acronym for the Society of Motion Picture and Television Engineers (SMPTE). SMPTE timecode is used to synchronize time between devices. The timecode is calculated in Hours:Minutes:Seconds:Frames, where Frames are fractions of a second based on the frame rate. Typical frame rates for SMPTE timecode can be 24, 25, 29.97 or 30 frames per second, depending on your local standards. *For more information, see Changing the ruler format on page 402.*

**Telecine**

The process of creating 30 fps video (television) from 24 fps film (cinema). *See also Inverse telecine on page 466 and Pulldown on page 468.*

**Tempo**

Tempo is the rhythmic rate of a musical composition, usually specified in beats per minute (BPM).

**Time Format**

The format in which Vegas Pro software displays the ruler and selection times. These include: time, seconds, frames and all standard SMPTE frame rates. *For more information, see Changing the ruler format on page 402.*

**Time Signature**

*See Beats per Measure on page 463.*

**Timeline**

The timeline, or track view, is the space where events appear on tracks.

**Track**

A discrete timeline for audio or video data. Events are placed on tracks and determine when sound or images start and stop. Multiple audio tracks are mixed together to give you a composite sound that you hear. Multiple video tracks are composited on top of each other to create the final video output.

**Track List**

The track list appears at the left side of the Vegas Pro workspace and contains the master controls for each track. From here you can adjust track volume or transparency, add track effects, mute or solo tracks, and reorder tracks.

**µ-Law**

µ-Law (mu-Law) is a companded compression algorithm for voice signals defined by the Geneva Recommendations (G.711). The G.711 recommendation defines µ-Law as a method of encoding 16-bit PCM signals into a nonlinear 8-bit format. The algorithm is commonly used in European and Asian telecommunications. µ-Law is very similar to A-Law, however, each uses a slightly different coder and decoder.

**Undo Buffer**

This is the temporary file created before you do any processing to a project. This undo buffer allows the ability to revert to previous versions of the project if you decide you don't like changes you've made to the project. This undo buffer is erased when the file is closed or when you choose **Clear Edit History** from the **Edit** menu.

**Undo/Redo**

These commands allow you to change a project back to a previous state when you don't like the changes you have made, or reapply the changes after you have undone them. The ability to undo/redo is only limited by the size of your hard drive. *See also Undo Buffer on page 472*.

**Undo/Redo History**

A list of all of the functions that have been performed to a file that are available to be undone or redone. The undo/redo history gives you the ability to undo or redo multiple functions. To display the history list, click the down-arrow on the **Undo** ( ) or **Redo** () button.

**Video for Windows (AVI)**

*See AVI on page 462*.

**Virtual MIDI Router (VMR)**

A software-only router for MIDI data between programs. Vegas Pro software uses the VMR to receive MIDI timecode and send MIDI clock. No MIDI hardware or cables are required for a VMR, so routing can only be performed between programs running on the same PC.

**WAV**

A digital audio file format developed by Microsoft and IBM. One minute of uncompressed audio requires 10 MB of storage.

**Waveform**

A waveform is the visual representation of wave-like phenomena, such as sound or light. For example, when the amplitude of sound pressure is graphed over time, pressure variations usually form a smooth waveform.

**Waveform Display**

A section inside of the Trimmer window or on an audio event that shows a graph of the sound data waveform. The vertical axis corresponds to the amplitude of the wave. For 16-bit sounds, the amplitude range is -32,768 to +32,767. For 24-bit sounds, the range is -8,388,607 to +8,388,607. The horizontal axis corresponds to time, with the left-most point being the start of the waveform. In memory, the horizontal axis corresponds to the number of samples from the start of the sound file.

**Zero-crossing**

A zero-crossing is the point where a fluctuating signal crosses the zero amplitude axis. By making edits at zero-crossings with the same slope, the chance of creating glitches is minimized. Vegas Pro software simulates zero crossings by applying short (10 mS default) fades to trimmed audio.

**Zipper noise**

Zipper noise occurs when you apply a changing gain to a signal, such as when fading out. If the gain does not change in small enough increments, zipper noise can become very noticeable. Vegas Pro software fades are accomplished using 64-bit arithmetic, thereby creating no zipper noise.

# Appendix C

# Keyboard Shortcuts

From the **Help** menu, choose **Keyboard Shortcuts** to view the shortcut keys that can help streamline your work with Vegas Pro software. The available shortcut keys are arranged in tables according to function.

**Note:** *The following shortcuts represent the default configuration. Your system may differ if you've used the Customize Keyboard dialog to customize your keyboard shortcuts. For more information, see* *Customizing keyboard shortcuts on page 412*.

### Project file shortcuts

| Command | Keyboard Shortcut |
|---|---|
| Create new project | Ctrl+N |
| Create new project and bypass Project Properties dialog | Ctrl+Shift+N |
| Open existing project or media file | Ctrl+O |
| Save project | Ctrl+S |
| Open project's properties | Alt+Enter |
| Close current project | Ctrl+F4 |
| Exit Vegas Pro software | Alt+F4 |

### Magnification and view shortcuts

| Command | Keyboard Shortcut |
|---|---|
| Set focus to timeline | Alt+0 |
| Show Explorer window (show/hide window if not docked) | Alt+1 |
| Show Trimmer window (show/hide window if not docked) | Alt+2 |
| Show Mixer window (show/hide window if not docked) | Alt+3 |
| Show Video Preview window (show/hide window if not docked) | Alt+4 |
| Show Project Media window (show/hide window if not docked) | Alt+5 |
| Show Edit Details window (show/hide window if not docked) | Alt+6 |
| Show Transitions window (show/hide window if not docked) | Alt+7 |
| Show Video FX window (show/hide window if not docked) | Alt+8 |
| Show Media Generators window (show/hide window if not docked) | Alt+9 |
| Show Plug-In Manager window (show/hide window if not docked) | Ctrl+Alt+1 |
| Show Video Scopes window (show/hide window if not docked) | Ctrl+Alt+2 |
| Show Surround Panner window (show/hide window if not docked) | Ctrl+Alt+3 |
| Show Media Manager window (show/hide window if not docked) | Ctrl+Alt+4 |
| Show XDCAM Explorer window (show/hide window if not docked) | Ctrl+Alt+5 |
| Show Mixing Console window (show/hide window if not docked) | Ctrl+Alt+6 |
| Show Device Explorer window (show/hide window if not docked) | Ctrl+Alt+7 |
| Show/hide audio bus tracks | B |
| Show/hide video bus track | Ctrl+Shift+B |
| Show/hide event media markers | Ctrl+Shift+K |
| Show/hide active take information | Ctrl+Shift+I |
| Show/hide waveforms on events in the timeline | Ctrl+Shift+W |
| Show/hide event buttons (**Generated Media**, **Event Pan/Crop**, **Video FX**, and **Recreate Generated Music**) | Ctrl+Shift+C |
| Show/hide event fade lengths between selected and nonselected events: | Ctrl+Shift+T |
| Toggles the display of the frame under the cursor when you perform edge trimming. For example, when you drag the edge of a video event with this command selected, the Video Preview window will update to draw the last frame in the event as you drag.<br>When the command is not selected, a static frame is displayed. | Ctrl+Shift+O |
| Show/hide envelopes | Ctrl+Shift+E |
| Show next window | F6 or Ctrl+Tab |
| Show previous window | Shift+F6 or Ctrl+Shift+Tab |
| Recall window layout | Alt+D, then press 0-9 |
| Save window layout | Ctrl+Alt+D, then press 0-9 |
| Load default window layout | Alt+D, then press D |
| Load audio mixing window layout | Alt+D, then press A |
| Load color correction window layout | Alt+D, then press C |
| Toggle focus between track list and timeline (and bus track list and timeline if bus tracks are visible) | Tab |
| Switch focus to previous/next track or bus track | Alt+Shift+Up/Down Arrow |
| Decrease height of all tracks or bus tracks (depending which has focus) | Ctrl+Shift+Down Arrow |
| Increase height of all tracks or bus tracks (depending which has focus) | Ctrl+Shift+Up Arrow |
| Minimize/restore track height<br>When restoring track height, tracks that you previously minimized are not restored. You can restore these tracks by clicking the **Restore Track Height** button ( ) on the track header. | Grave Accent (`) |
| Set track heights to default height | Ctrl+Grave Accent (`) |
| Minimize/restore the window docking area | F11 or Alt+Grave Accent (`) |
| Maximize/restore the timeline vertically and horizontally (window docking area and track list will be hidden) | Ctrl+F11 or Ctrl+Alt+Grave Accent (`) |

| Command | Keyboard Shortcut |
|---|---|
| Minimize/restore the track list | Shift+F11 or Shift+Alt+Grave Accent (`) |
| Zoom in/out horizontally in small increments (if timeline has focus) | Up/Down Arrow |
| Zoom in/out horizontally in large increments or zoom to selection (if one exists) | Ctrl+Up/Down Arrow |
| Zoom in time until each video thumbnail represents one frame | Alt + Up Arrow |
| Zoom waveforms in/out vertically (audio only) | Shift+Up/Down Arrow |

**Cursor placement, loop region, and time selection commands**

Most of the cursor placement commands, when combined with the Shift key, also perform selection.

| Command | Keyboard Shortcut |
|---|---|
| Center view around cursor | \ |
| Go to | Ctrl+G |
| Set end of time selection | Ctrl+Shift+G |
| Go to beginning of time selection or viewable area (if no time selection) | Home |
| Go to end of time selection or viewable area (if no time selection) | End |
| Go to beginning of project | Ctrl+Home or W |
| Go to end of project | Ctrl+End |
| Select loop region | Shift+Q |
| Restore previous five time selections | Backspace |
| Move left by grid marks | Page Up |
| Move right by grid marks | Page Down |
| Move left/right one pixel (when **Quantize to Frames** is turned off) | Left or Right Arrow |
| Move to previous/next marker | Ctrl+Left/Right Arrow |
| Move one frame left/right | Alt+Left or Right Arrow |
| Move left/right to event edit points (including fade edges) | Ctrl+Alt+Left/Right Arrow |
| Jog left/right (when not in edge-trimming mode or during playback) | F3/F9 |
| Move edit cursor to playback cursor during playback | Alt+Down Arrow |
| Move cursor to corresponding marker or select corresponding region | 0-9 keys (not numeric keypad) |
| Move to previous CD track | Ctrl+Comma |
| Move to next CD track | Ctrl+Period |
| Move to previous CD index or region | Comma |
| Move to next CD index or region | Period |
| Set in and out points | I (in) and O (out) |
| Create time selection while dragging on an event | Ctrl+Shift+drag with mouse |

### General editing commands

| Command | Keyboard Shortcut |
|---|---|
| Cut selection | Ctrl+X or Shift+Delete |
| Copy selection | Ctrl+C or Ctrl+Insert |
| Paste from clipboard | Ctrl+V or Shift+Insert |
| Paste insert | Ctrl+Shift+V |
| Paste repeat | Ctrl+B |
| Delete selection | Delete |
| Trim event to selection | Ctrl+T |
| Render to new track | Ctrl+M |
| Undo | Ctrl+Z or Alt+Backspace |
| Redo | Ctrl+Shift+Z or Ctrl+Y |
| Rebuild audio peaks | Shift+F5 |
| Switch to normal editing tool | Ctrl+D |
| Switch to next editing tool | D |
| Switch to previous editing tool | Shift+D |
| Enable multicamera editing | Ctrl+Shift+D |

### Event selection and editing commands

| Command | Keyboard Shortcut |
|---|---|
| Range select | Shift+click events |
| Multiple select | Ctrl+click individual events |
| Select all | Ctrl+A |
| Unselect all | Ctrl+Shift+A |
| Cut selection | Ctrl+X or Shift+Delete |
| Copy selection | Ctrl+C or Ctrl+Insert |
| Paste from clipboard | Ctrl+V or Shift+Insert |
| Paste insert | Ctrl+Shift+V |
| Paste repeat | Ctrl+B |
| Delete selection | Delete |
| Split events at cursor | S |
| Trim/crop selected events | Ctrl+T |
| Enter edge-trimming mode and select event start; move to previous event edge<br>In this mode, 1, 3, 4, and 6 on the numeric keypad trim the selected event edge. Hold Ctrl while pressing 1, 3, 4, or 6 to time compress/stretch, or hold Alt while pressing 1, 3, 4, or 6 to slip trim, or hold Ctrl+Alt while pressing 1, 3, 4, or 6 to slide a transition or crossfade. | Numeric Keypad 7 or [ |
| Enter edge-trimming mode and select event end; move to next event edge<br>In this mode, 1, 3, 4, and 6 on the numeric keypad trim the selected event edge | Numeric Keypad 9 or ] |
| Trim left/right (when in edge-trimming mode) | F3/F9 |
| Exit edge-trimming mode | Numeric Keypad 5 |
| Move or trim selected events one frame left/right | Numeric Keypad 1/3 |
| Move or trim selected events one pixel left/right | Numeric Keypad 4/6 |
| Move selected events up/down one track | Numeric Keypad 8/2 |
| Slip: move media within event without moving the event | Alt+drag inside the event |
| Slip trim: moves the media with the edge as it is trimmed | Alt+drag edge of event |
| Trim adjacent: trims selected event and adjacent event simultaneously | Ctrl+Alt+drag edge of event |
| Slip-trim right edge of event | Alt+Shift+drag event |
| Event split or split/trim | Ctrl+Alt+Shift+click or drag event |

| Command | Keyboard Shortcut |
|---|---|
| Slide: trims both ends of event simultaneously | Ctrl+Alt+drag middle of event |
| Slide crossfade: moves crossfade | Ctrl+Alt+drag over a crossfade |
| Stretch (compress) the media in the event while trimming | Ctrl+drag edge of event |
| Raise pitch one semitone | = (not numeric keypad) |
| Raise pitch one cent | Ctrl+= |
| Raise pitch one octave | Shift+= |
| Lower pitch one semitone | - (not numeric keypad) |
| Lower pitch one cent | Ctrl+- |
| Lower pitch one octave | Shift+- |
| Reset pitch | Ctrl+Shift+= or Ctrl+Shift+- |
| Select next take | T |
| Select previous take | Shift+T |
| Convert cut to transition | Numeric Keypad /<br>Numeric Keypad *<br>Numeric Keypad - |
| Convert transition to cut | Ctrl+Numeric Keypad / |
| Open in audio editor | Ctrl+E |

### Red eye reduction commands

| Command | Keyboard Shortcut |
|---|---|
| Scroll Left/Right | Right/Left Arrow<br>Press Shift to scroll quickly |
| Scroll Up/Down | Up/Down Arrow<br>Press Shift to scroll quickly |
| Jump to top/bottom of image | Page Up/Down<br>Shift+Home/End |
| Jump to left/right edge of image | Home/End<br>Shift+Page Up/Down |
| Jump to horizontal center of image | \<br>Numeric Keypad * |
| Jump to vertical center of image | \<br>Numeric Keypad * |
| Jump to horizontal and vertical center of image | C |

### Playback, recording, and preview commands

| Command | Keyboard Shortcut |
|---|---|
| Arm track for record | Ctrl+Alt+R |
| Arm for record and set recording path | Ctrl+Alt+Shift+R |
| Record | Ctrl+R |
| Looped playback | Q or Ctrl+Shift+L |
| Play from start | Shift+Spacebar or Shift+F12 |
| Start playback | Spacebar |
| Play from any window | Ctrl+Spacebar or F12 |
| Play/pause | Enter or Ctrl+F12 |
| Stop playback | Spacebar or Esc |
| Go to start of project | Ctrl+Home |
| Go to end of project | Ctrl+End |
| Go to previous frame | Alt+Left Arrow |

| Command | Keyboard Shortcut |
|---|---|
| Go to next frame | Alt+Right Arrow |
| Dim (attenuate) mixer output | Ctrl+Shift+F12 |
| Preview cursor position<br>You can specify the length of the time that is previewed using the **Cursor preview duration** box on the Editing tab of the Preferences dialog. | Numeric Keypad 0 |
| Scrub playback | J, K, or L |
| Selectively prerender video | Shift+M |
| Build dynamic RAM preview | Shift+B |
| Toggle external monitor preview | Alt+Shift+4 |
| Generate MIDI timecode | F7 |
| Generate MIDI clock | Shift+F7 |
| Trigger from MIDI timecode | Ctrl+F7 |
| Enable multicamera editing | Ctrl+Shift+D |
| Choose multicamera take | 1 - 9 |
| Choose multicamera take with crossfade | Ctrl+1 - 9 |

### Timeline and track list commands

| Command | Keyboard Shortcut |
|---|---|
| Insert new audio track | Ctrl+Q |
| Insert new video track | Ctrl+Shift+Q |
| Change audio track volume or video track compositing level (when focus is on track list) | Ctrl+Left/Right Arrow |
| Change audio track panning or video track fade-to-color setting (when focus is on track list and automation controls are visible)<br><br>**Note:** *Select the* **Automation Settings** *button ( ) to adjust the track fade-to-color setting.* | Ctrl+Shift+Left/Right Arrow |
| Mute selected tracks | Z |
| Mute selected track and remove other tracks from mute group | Shift+Z |
| Solo selected tracks | X |
| Solo selected track and remove other tracks from solo group | Shift+X |
| Mute selected track group | Ctrl+Alt+Z |
| Mute selected track group and remove other track groups from the mute group | Ctrl+Alt+Shift+Z |
| Solo selected track group | Ctrl+Alt+X |
| Solo selected track group and remove other track groups from the solo group | Ctrl+Alt+Shift+X |
| Override snapping (if snapping is on) or enable snapping (if snapping is off) | Shift+drag |
| Quantize to frames | Alt+F8 |
| Enable/disable snapping | F8 |
| Snap to grid | Ctrl+F8 |
| Snap to markers | Shift+F8 |
| Post-edit ripple affected tracks | F |
| Post-edit ripple affected tracks, bus tracks, markers, and regions | Ctrl+F |
| Post-edit ripple all tracks, markers, and regions | Ctrl+Shift+F |
| Auto ripple mode | Ctrl+L |
| Automatic crossfades | Ctrl+Shift+X |
| Render to new track | Ctrl+M |
| Group selected events | G |
| Ungroup selected events | U |
| Ignore event grouping | Ctrl+Shift+U |
| Clear group without deleting events | Ctrl+U |
| Select all events in group | Shift+G |
| Insert/show/hide track volume envelope | V |
| Remove track volume envelope | Shift+V |
| Insert/show/hide track panning envelope | P |
| Remove track panning envelope | Shift+P |
| Cycle through effect automation envelopes | E and Shift+E |
| Show/hide envelopes | Ctrl+Shift+E |
| Adjust envelope point up/down by one pixel | Select envelope point and hold the mouse button, then press 8 or 2 on the numeric keypad |
| Adjust envelope point left /right by one pixel | Select envelope point and hold the mouse button, then press 4 or 6 on the numeric keypad |
| Adjust envelope point value in fine increments without changing the point's timeline position | Ctrl+ drag envelope point or segment |
| Adjust envelope point value in normal increments without changing the point's timeline position | Ctrl+Alt+ drag envelope point or segment |
| Adjust envelope point's timeline position without changing its value | Alt+ drag |
| Insert command marker | C |

| Command | Keyboard Shortcut |
|---|---|
| Insert marker | M |
| Insert region | R |
| Insert CD track region | N |
| Insert CD track index | Shift+N |

### Trimmer window commands

The following commands apply to the Trimmer window. Many of the shortcuts that apply to the timeline also work in the Trimmer. The following list highlights commands unique to the Trimmer.

| Command | Keyboard Shortcut |
|---|---|
| Add media from cursor | A |
| Add media to cursor | Shift+A |
| Transfer time selection from timeline to Trimmer after cursor | T |
| Transfer time selection from timeline to Trimmer before cursor | Shift+T |
| Toggle selected stream: audio/video/both | Tab |
| Toggle audio/video stream height | Ctrl+Shift+Up/Down Arrow |
| Sort Trimmer history | H |
| Clear Trimmer history | Ctrl+Shift+H |
| Remove current media from Trimmer history | Ctrl+H |
| Save markers/regions | S |
| Toggle automatic marker/region saving | Shift+S |
| Open in audio editor | Ctrl+E |
| Show video in Video Preview window | Ctrl+P |

### Track Motion window shortcuts

The following commands apply to the Track Motion and 3D Track Motion windows.

| Command | Keyboard Shortcut |
|---|---|
| Change 3D layout | 1-6 (not numeric keypad) |
| Lock aspect ratio | A |
| Scale about center | C |
| Edit in object space | O |
| Prevent movement | X, Y, and Z |
| Prevent scaling | Shift+X, Shift+Y, and Shift+Z |
| Enable snapping | F8 |
| Enable rotation | Shift+F8 |

### Surround Panner commands

Add Ctrl to the following shortcuts if you want to move the pan point in fine increments.

| Description | Keyboard Shortcut |
|---|---|
| Constrain motion to a line through the center of the surround panner | Shift+drag the pan point (only when **Move Freely** ( ) is selected) |
| Constrain motion to a constant radius from the center | Alt+drag the pan point (only when **Move Freely** ( ) is selected)<br>Alt+mouse wheel |

| Description | Keyboard Shortcut |
|---|---|
| Constrain motion to the maximum circle that will fit in the Surround Panner | Alt+Shift+drag the pan point (only when **Move Freely** ( ) is selected) |
| | Alt+Shift+mouse wheel |
| Move the pan point forward/back (when the pan point is selected) | Up/down arrow |
| | Page Up/Page Down |
| | Mouse wheel |
| Move the pan point left/right (when the pan point is selected) | Left/Right Arrow |
| | Shift+Page Up/Page Down |
| | Shift + mouse wheel forward/back |
| Move the pan point to a corner, edge, or center of the Surround Panner (when the pan point is selected) | Numeric Keypad |
| Move the pan point to a corner on the largest circle that will fit in the Surround Panner (when the pan point is selected) | Ctrl+Numeric Keypad 1,3,7,9 |

### Mixing Console commands

| Command | Keyboard Shortcut |
|---|---|
| Rename selected channel | F2 |
| Insert new audio track | Ctrl+Q |
| Cycle default/narrow/wide channel strips | D/N/W |
| Hide the selected channel strip | Shift+H |
| Show the Channel List pane | Shift+C |
| Show/hide all channel strips | Q |
| Show/hide audio bus channel strips | U |
| Show/hide audio track channel strips | A |
| Show/hide assignable effects channel strips | E |
| Show/hide master bus channel strip | T |
| Show/hide preview channel strip | P |
| Show/hide fader ticks | Shift+T |
| Show/hide control region labels | Shift+L |
| Show/hide Faders control region | F |
| Show/hide Insert FX control region | I |
| Show/hide I/O control region | H |
| Show/hide Meters control region | M |
| Show/hide Sends control region | S |

### Miscellaneous commands

| Command | Keyboard Shortcut |
|---|---|
| Online help | F1 |
| Context-sensitive help (What's This Help) | Shift+F1 |
| Shortcut menu | Shift+F10 |
| Make fine fader/slider adjustments | Ctrl+drag |
| Change relative keyframe spacing | Alt+drag keyframes |
| Move region without changing length | Alt+drag region tag |
| Rebuild audio peaks | F5 |

### Multimedia keyboard shortcuts

| Command | Keyboard Shortcut |
|---|---|
| Play/Pause | Play/Pause |
| Play from start | Shift+Play/Pause |
| Stop | Stop |
| Mute track | Mute |
| Mute track and remove other tracks from mute group | Shift+Mute |
| Solo track | Ctrl+Mute |
| Solo track and remove other tracks from solo group | Ctrl+Shift+Mute |
| Change audio track volume or video track compositing level (when focus is on track list) | Ctrl+Volume Up/Down |
| Change audio track panning or video track fade-to-color setting (when focus is on track list) | Shift+Volume Up/Down |
| Change track focus | Next/Prev Track |

### Mouse wheel shortcuts

| Command | Shortcut |
|---|---|
| Zoom in/out | Wheel |
| Scroll vertically | Ctrl+wheel |
| Scroll horizontally | Shift+wheel |
| Move the cursor in small increments | Ctrl+Shift+wheel |
| Trim the selected event edge one pixel (if you're in edge-trimming mode) | |
| Adjust scrub rate during playback | |
| Move cursor one frame at a time | Ctrl+Shift+Alt+wheel |
| Trim the selected event edge one frame (if you're in edge-trimming mode) | |
| Adjust scrub rate during playback | |
| Move fader/slider<br>In plug-in windows, click the control first to give it focus. | Hover over fader and use wheel |
| Move fader/slider in fine increments | Ctrl+hover over fader and use wheel |

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